IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

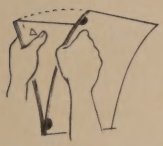
This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

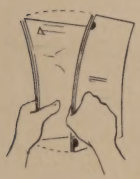
DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***



1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.



2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 493 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JULY 1960

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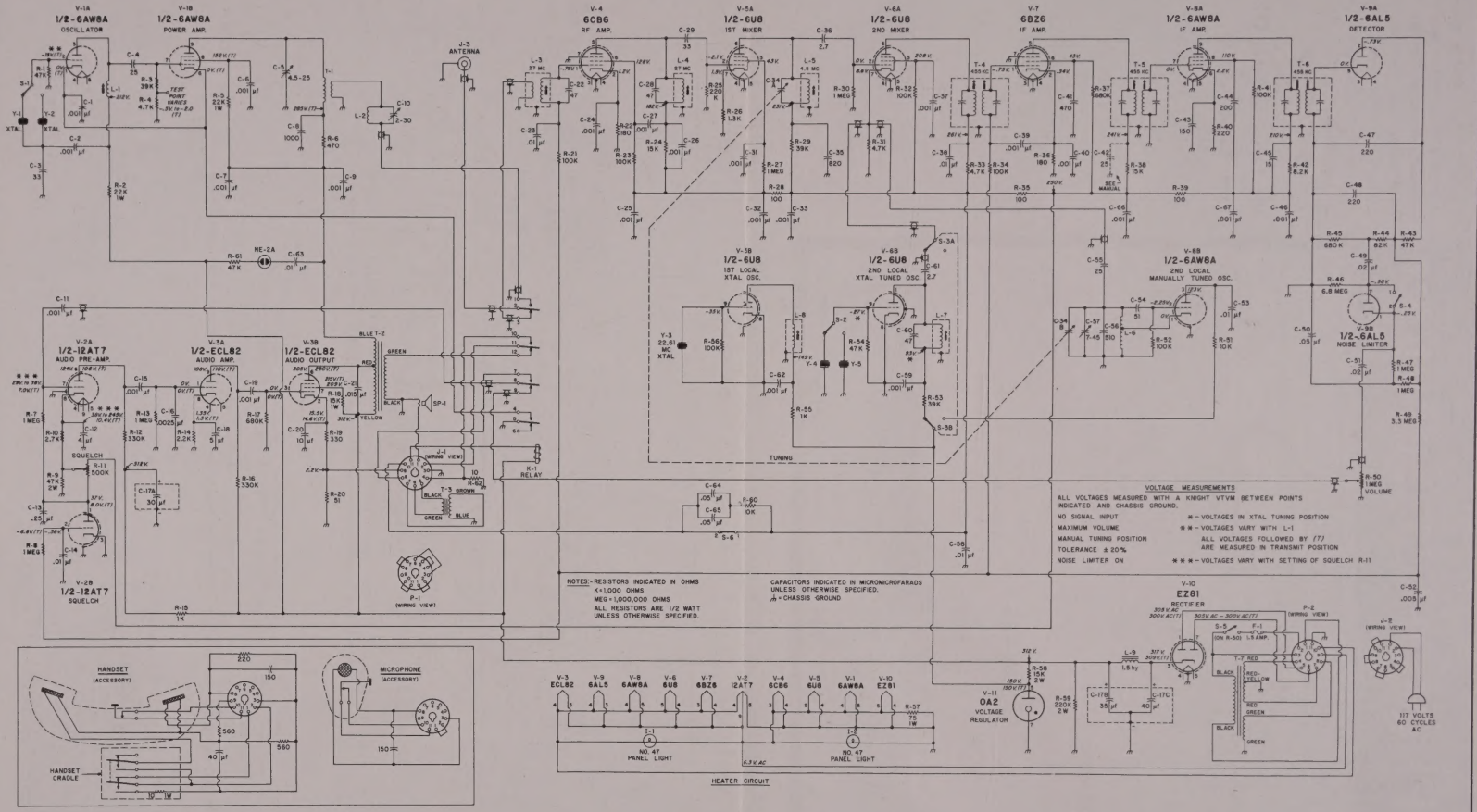
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

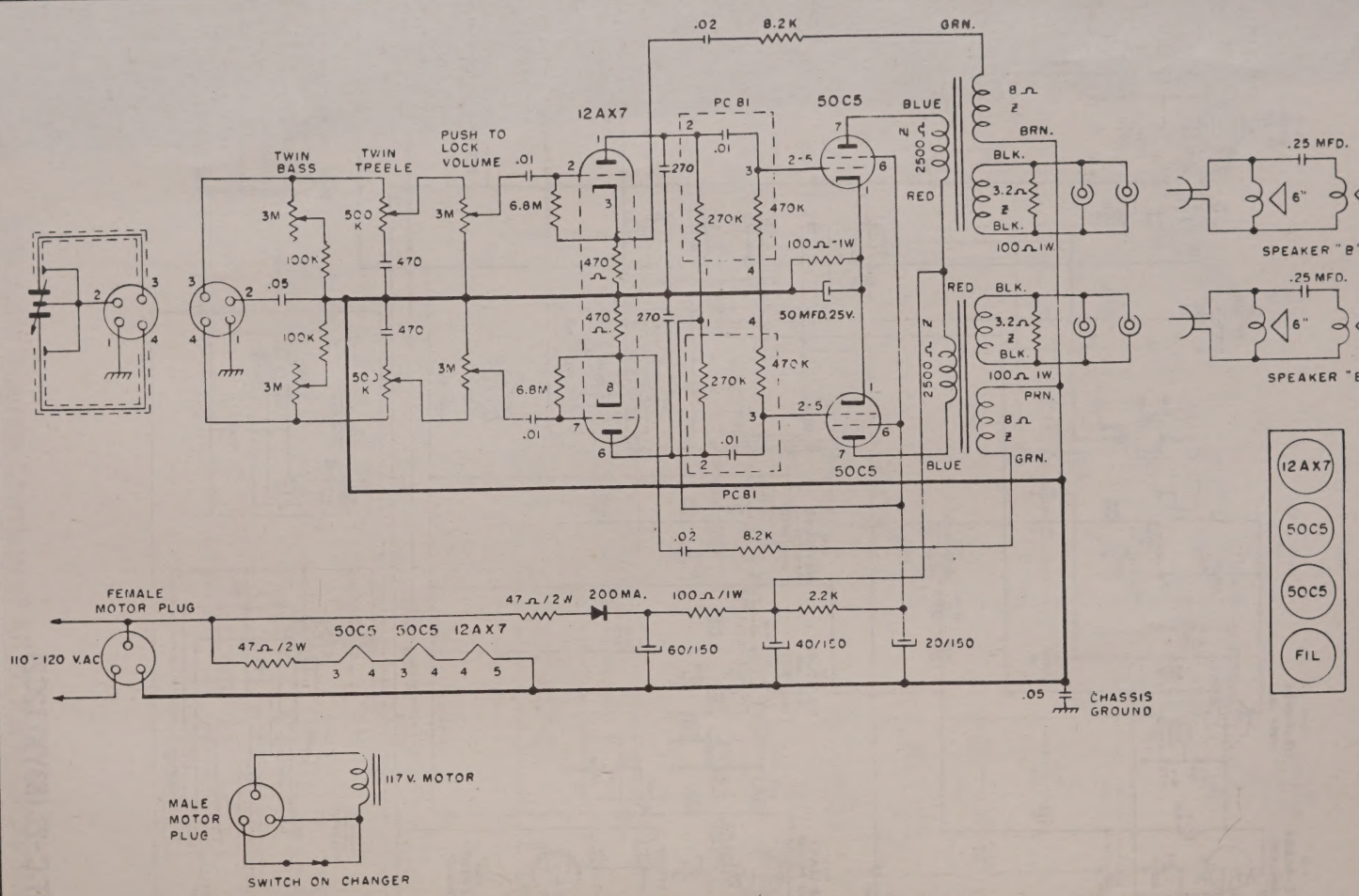
Knight Model
C-27 (83YX712C2)

Symphonic Model
1525



KNIGHT C-27 (83YX712C2)

Schematic Diagram Courtesy of Allied Radio Corporation



SYMPHONIC MODEL 1525

Schematic Diagram Courtesy of Symphonic Electronics Corp.

PHOTOFACT® Folder

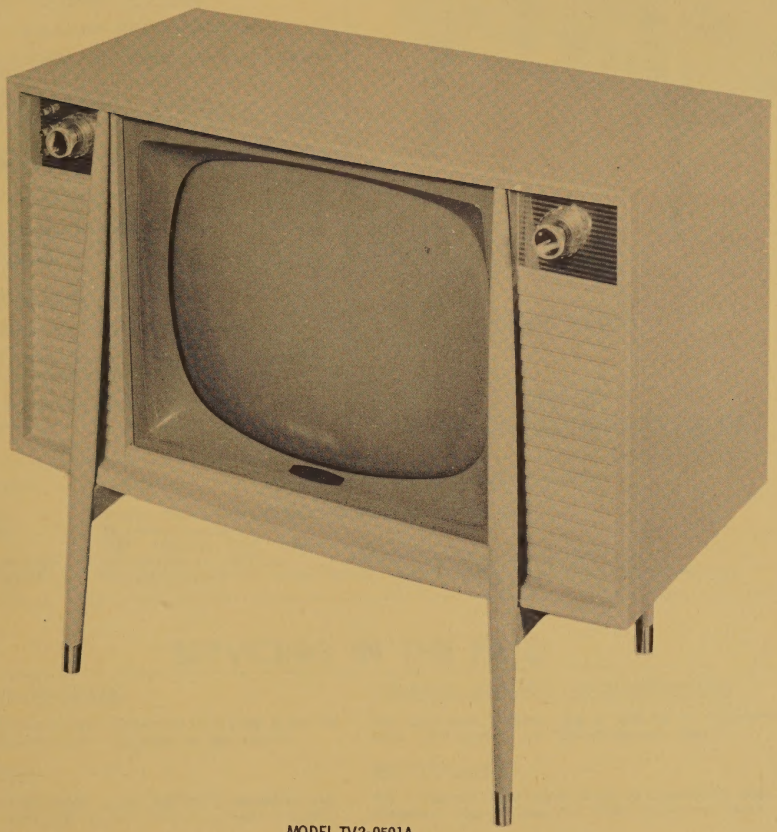
CORONADO MODELS
TV2-9590A, -9591A, -9592A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

CORONADO MODELS
TV2-9590A, -9591A, -9592A



MODEL TV2-9591A

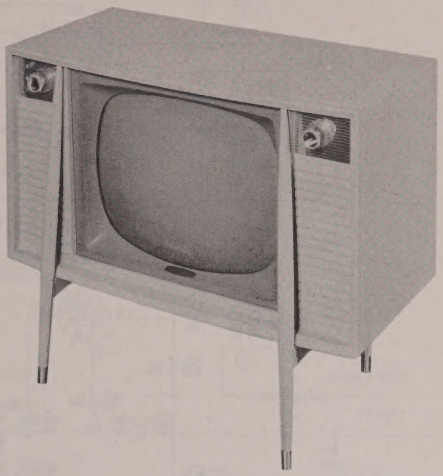
CORONADO MODELS
TV2-9590A, -9591A, -9592A

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

CORONADO MODELS TV2-9590A, -9591A, -9592A

CORONADO MODELS TV2-9590A, -9591A, -9592A



MODEL TV2-9591A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL TV2-9591A

1. Remove 7 push-on type knobs in front of cabinet.
2. Remove 8 wood screws holding rear cover. Remove rear cover.
3. Remove picture tube socket, yoke plug, speaker leads, and 2 screws holding mounting bracket for controls.
4. Remove 4 screws holding tuner and ground rod from chassis to tuner.
5. Remove high voltage lead.
6. Remove 4 chassis bolts under cabinet.
7. Remove chassis.

PICTURE TUBE REMOVAL

1. Follow steps 1 thru 7 of "Chassis Removal".
2. Remove 2 bolts holding mounting at bottom of cabinet. Remove 4 wood screws holding mounting at top.
3. Pull picture tube straight out.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	CORONADO MODELS TV2-9590A, TV2-9591A, TV2-9592A
SUPPLIER	Gamble-Skogmo, Inc., 15 North 8th Street, Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	VHF - Fourteen, UHF - Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 140 Watts, 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 wood screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE DEVICE

A 7.5Ω fusible resistor is used for low voltage power supply protection. (For location, see R63 in Photo "Chassis - Top View.)

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning Knobs.

AGC

The AGC may be varied by means of a range switch. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The Horizontal Drive may be varied by a Horizontal Drive Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

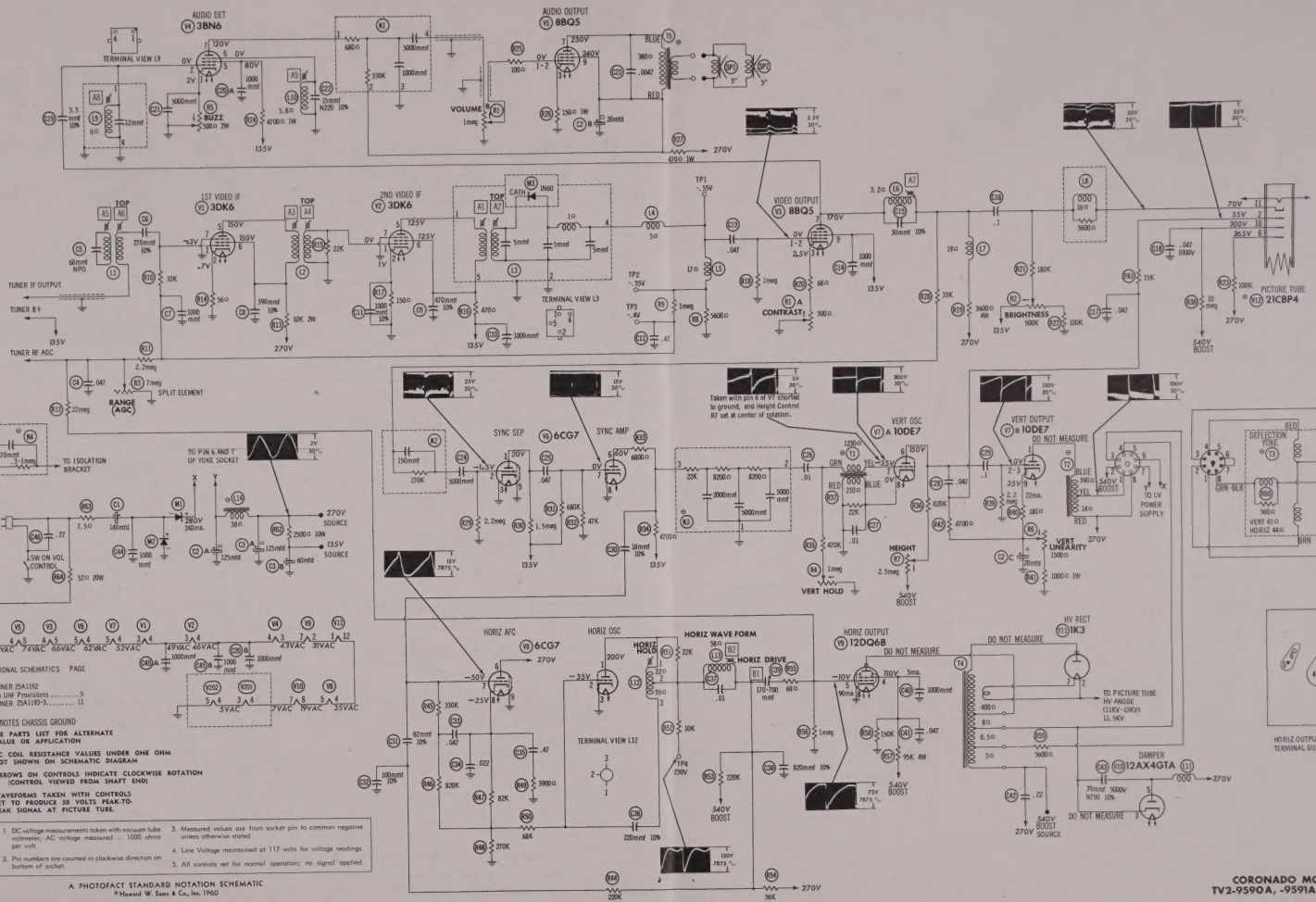
CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KA92


AUDIO DET
V4 3BN6
AUDIO OUTPUT
V5 BBQ5
1ST VIDEO IF
V1 3DK6
2ND VIDEO IF
V2 3DK6
VIDEO OUTPUT
V3 BBQ5
PICTURE TUBE
V12 21CBP4
SYNC SEP
V6 6CG7
SYNC AMP
VERT OSC
V7 A 10DE7
VERT OUTPUT
V7 B 10DE7
HORIZ AFC
V8 6CG7
HORIZ OSC
HORIZ WAVE FORM
HORIZ OUTPUT
V9 12DQ68
HV RECT
V11 1K3
DAMPER
V10 12AX4GTA
DO NOT MEASURE
TERMINAL VIEW L9
TERMINAL VIEW L3
TERMINAL VIEW L12
TUNER IF OUTPUT
TUNER B+
TUNER RF AGC
RANGE (AGC)
SPLIT ELEMENT
TO ISOLATION BRACKET
TO PIN 6 AND 7 OF YOKE SOCKET
SW ON VOL CONTROL
VOLUME
BUZZ
CONTRAST
BRIGHTNESS
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ HOLD
HORIZ DRIVE
DEFLECTION YOKE
TO LV POWER SUPPLY
TO PICTURE TUBE HV ANODE (11KV-13KV) 11.5KV
HORIZ OUTPUT TRANS TERMINAL GUIDE
270V SOURCE
13.5V SOURCE
540V BOOST
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 25A1192 with UHF Provisions 5
UHF TUNER 25A1193-3 11
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured ..... 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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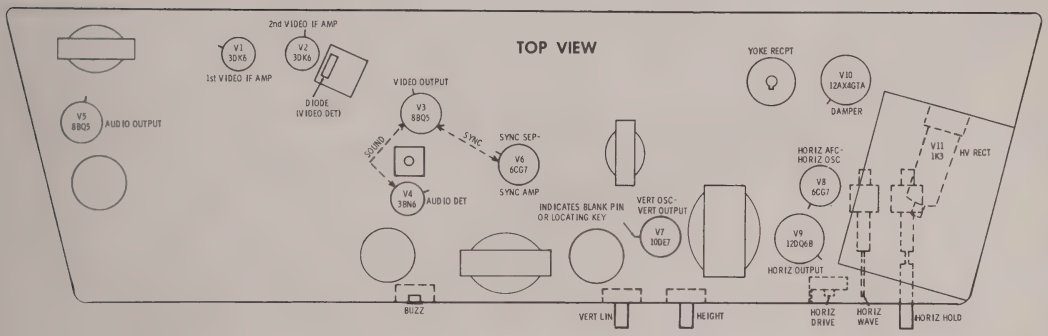
CORONADO MODELS
TV2-9590A, -9591A, -9592A

TUBE PLACEMENT CHART



CORONADO MODELS
TV2-9590A, -9591A, -9592A

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

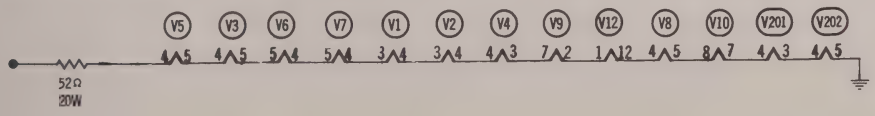
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rect. (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, Rect. (B+)
Vert. off freq. V7
Horiz. off freq. Diode (Horiz. AFC), V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V8, V9
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A9 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point TP3. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4 Volts peak to peak on scope.	44.0MC (10MC Swp.)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to TP-2. Low side to chassis. (Across Video Det. load.)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker positions and A2 controls gain and symmetry.
2.	High side thru .01mfd to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust output to 4 Volts peak to peak on scope.	"	42.4MC 43.5MC 44.5MC 55.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker positions and A4 controls gain and symmetry.
3.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6 & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to TP-1. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10VAC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz Control for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjustment, further reduce the signal strength.

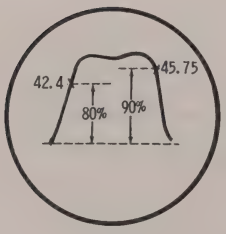


FIG. 1

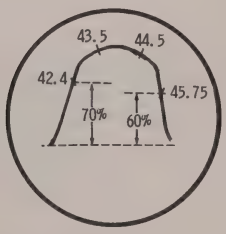


FIG. 2

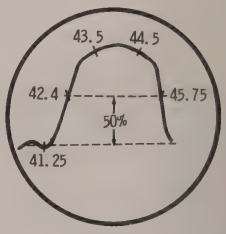
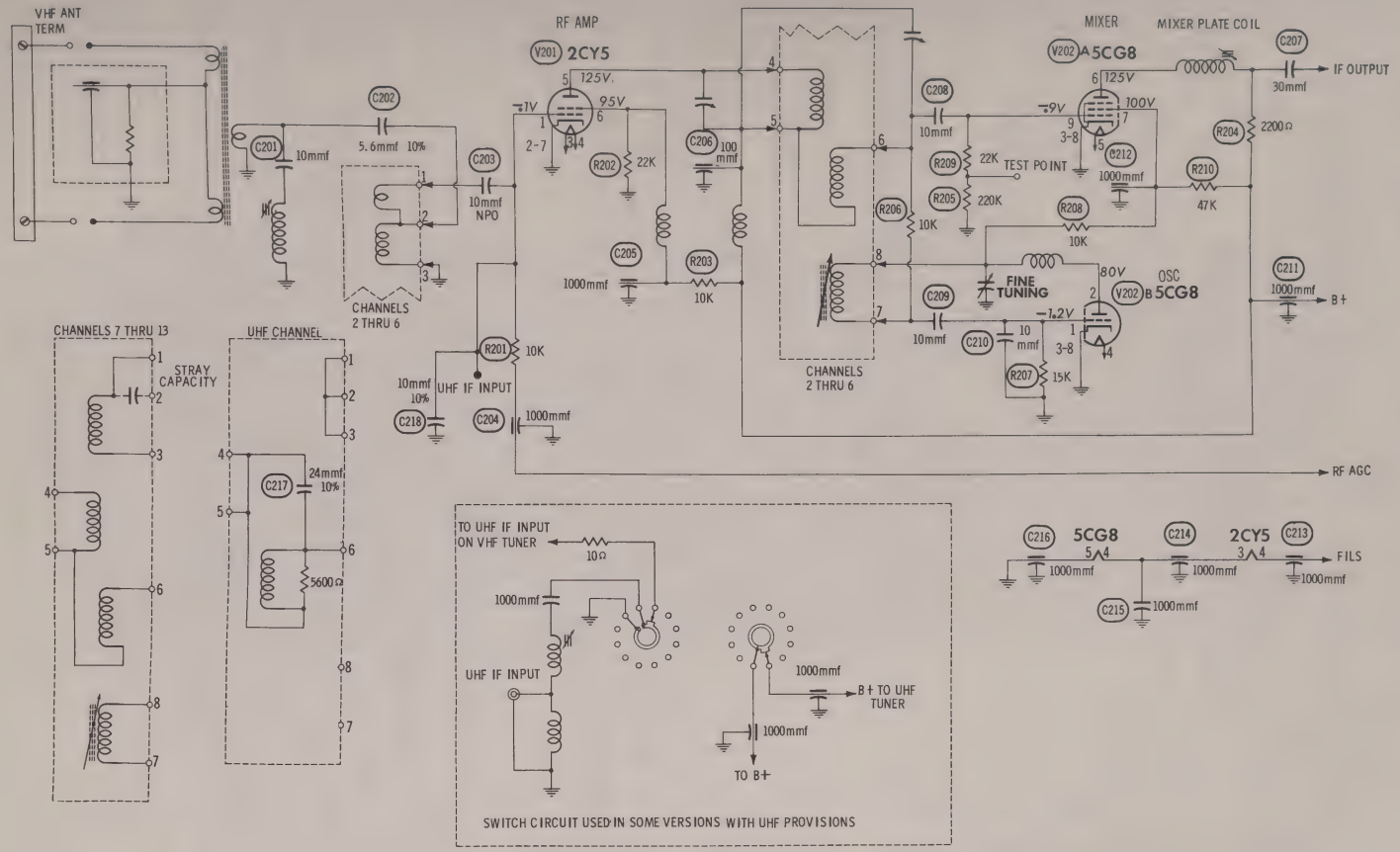


FIG. 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER with UHF Provisions 25All92

CORONADO MODELS
TV2-9590A, -9591A, -9592A

TUNER PARTS LIST AND DESCRIPTIONS

25A1192

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2CY5	V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	5.6 10%							10TCC-V5.6
C203	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	100		EF-0001	MFT-100				
C207	30							
C208	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C209	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C210	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	1000		EF-001	MFT-1000		CCF-102	CT280A	
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10T8-D10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	24 10%		NPO-SI 24	TCZ-24	C10Q24C	CCTO-240	CNO-427	10TCC-Q25
C218	10 10%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	10K	
R202	22K	
R203	10K	
R204	2200Ω	

ITEM No.	RATING	REMARKS
R205	220K	
R206	10K	
R207	15K	
R208	10K	

ITEM No.	RATING	REMARKS
R209	22K	
R210	47K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA
K201	VHF Antenna Filter			

TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

Suggested Alignment Tools: GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

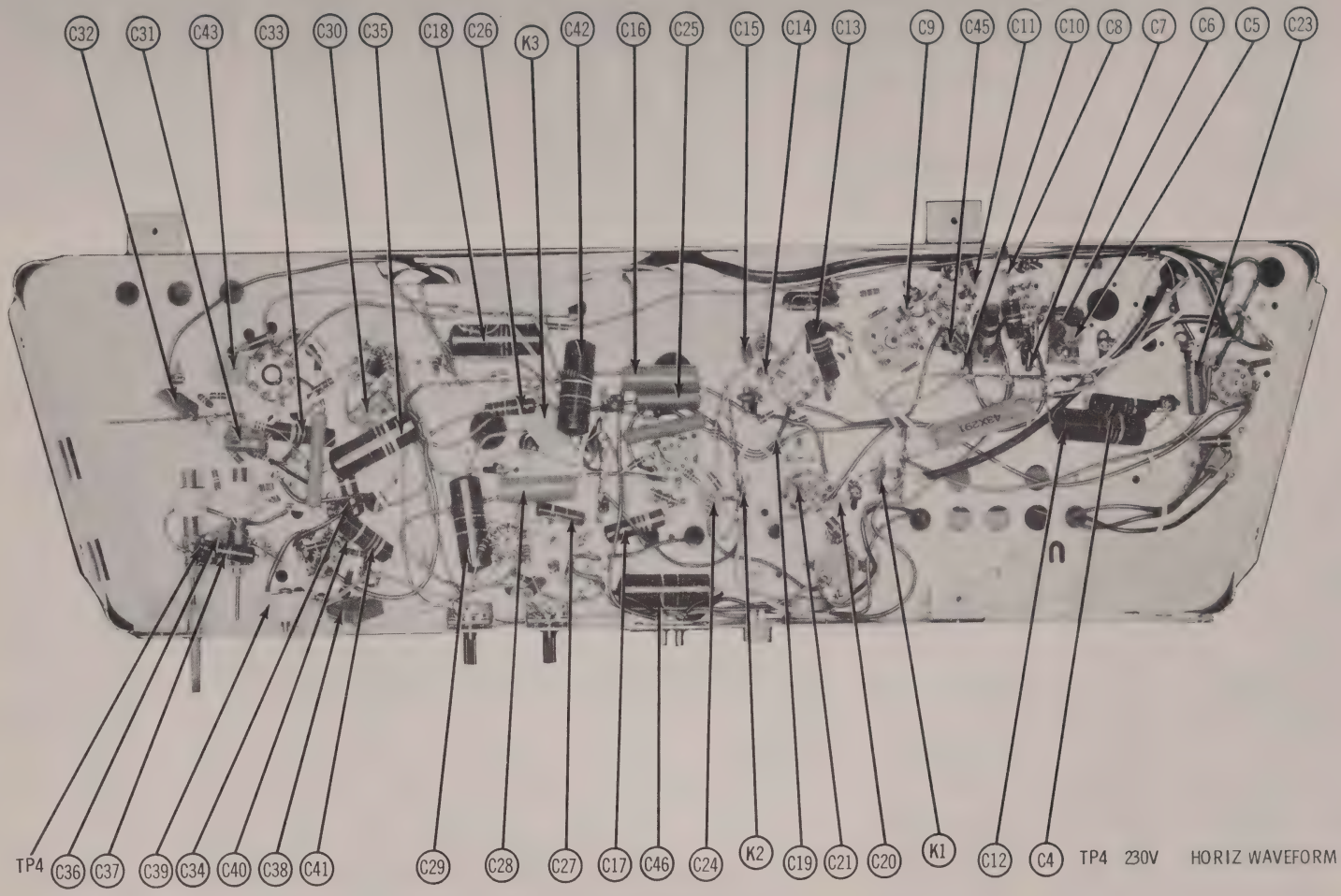
The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



CHASSIS BOTTOM VIEW - CAPACITOR AND MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	3DE8
V2	2nd Video IF Amp.	3DE8
V3	Video Output	6BQ6
V4	Audio Det.	3BN6
V5	Audio Output	6BQ6
V6	Sync Sep. - Sync Amp.	6CQ7
V7	Vert. Osc. - Vert. Output	19DE7
V8	Horiz. AFC - Horiz. Osc.	6CQ7
V9	Horiz. Output	12AQ8B
V10	Damper	12AX4GTA
V11	HV Rect.	1B3

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: CORONADO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V12	21CBP4 ① / 21CBP4A ③	21CBP4A ① / 21CBP4 ②	21CBP4-A ① / 21CBP4 ②	21CBP4/21CBP4A ① / 21CBP4/21CBP4A ②	21CBP4/21CBP4A ① / 21CBP4/21CBP4A ②	① Aluminized ② Silver Screen "85" ③ Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	140	150	43X431	AFHS1-23	FP117	TM3-24	TVL-1428		
C2A	±125	300	45X431	AFH4-02-60	XC0733.2	FP454.4	TMT-26	TVL5-3574.3*	
B	±20	300							
C	±40	50							
C3A	±125	300	45X467	AFH3-99-62	D0046	FP330.27	TMT-36	TVL-3574.6	
B	±60	300							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 300V		P288N-047	DD-503	CUB2B47	4DP-3-473	GEM-4147	27M-S47
C5	68 NPO		NPO-21 68	DTZ-68	CUQ68C	CCTO-680	CNO-468	10TCC-Q68
C6	270 10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C7	1000		BPD-001	DD-102	BYA10DL	CCD-103	B-210	5HK-D10
C8	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C9	470 10%		DI-470	DD-471	SRS T47	CCD-471	GP347	10TS-T47
C10	1000		BPD-001	DD-102	BYA10DL	CCD-103	B-210	5HK-D10
C11	1000 10%		DI-1000	DD-103	BR3	CCD-102	GP410	10TS-D10
C12	.47 200V		P288N-47		CUB2P47	3DP-5-474	GEM-3047	27M-P47
C13	.047 300V		P288N-047	DD-503	CUB2B47	4DP-3-473	GEM-4147	27M-S47
C14	1000		BPD-001	DD-103	BYA10DL	CCD-103	B-210	5HK-D10
C15	30 10%		DI-30	DD-300	L10G3	CCD-300	GP430	10TS-Q30
C16	.1 400V		P488N-1	DD-104	CUB4P1	4DP-4-104	GEM-4101	47M-P1
C17	.047 300V		P288N-047	DD-503	CUB2B47	4DP-3-473	GEM-4147	27M-S47
C18	.047 1000V		P108N-047		CUB10B47	10DP-5-473	GEM-10147	10TM-S47
C19	3.3 10%		NPO-SI 3.3	TCZ-3R3	C10Y33C	CCTO-3R3	CNO-333	10TCC-Y33
C20A	1000		BPD-2X001	DD3-102	BYD6DDL	CCD-102	B2X1K0	5HK-2D10
B	1000					CCD-103		
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C22	15 N220 10%							10TCH-Q15
C23	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C24	5000		BPD-005	DD-502	BYA10D6	CCD-502	B-260	5HK-D60
C25	.047 400V		P488N-047	DD-503	CUB4B47	4DP-3-473	GEM-4147	47M-S47
C26	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	47M-S1
C27	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	47M-S1
C28	.047 600V		P688N-047	DD-503	CUB6B47	6DP-3-473	GEM-6147	67M-S47
C29	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	67M-P1
C30	18 10%		1469-000018	TCZ-18	22R5Q18	CM-18D-180K	CNO-418	MS-418
C31	82 10%		1469-000082	TCZ-82	22R5Q82	CM-18D-820K	CNO-482	MS-482
C32	100 10%		1469-0001	TCZ-100	22R5T1	CM-18D-101K	MCD2S5	MS-2S10
C33	.047 200V		P488N-047	DD-503	CUB2B47	4DP-3-473	GEM-4147	27M-S47
C34	.022 200V		P288N-022	DD-303	CUB4S22	4DP-2-223	GEM-4122	27M-S22
C35	.47 200V		P288N-47		CUB2P47	3DP-5-474	GEM-3047	27M-P47
C36	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-522	MS-522
C37	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	47M-S1
C38	230 ±10%		1469-00023		22R5T23	CM-19B-231K	MCD2S1	MS-2S3
C39	170-700		617A276			469		
C40	1000		BPD-001	DD-102	BYA10DL	CCD-103	B-210	5HK-D10
C41	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	47M-S47
C42	.22 400V		P488N-23		CUB4P22	4DP-5-234	GEM-4022	47M-P22
C43	39 5000V N750 10%							
C44	1000		BPD-001	DD-102	BYA10DL	CCD-102	B-210	5HK-D10
C45A	1000		BPD-2X001	DD3-102	BYD6DDL	CCD-103	B2X1K0	5HK-2D10
B	1000					CCD-102		
C46	.22 400V		P488N-23		CUB4P22	4DP-5-234	GEM-4022	47M-P22

Coronado Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	78X36	F1-1	RTV-705			Contrast
B	1meg	½		R2-S1			◆U24128	Volume
C	Switch			KR-1			—	Power Off-On
R2A	500K	½	40X482	B-59	A47-500K-S	Q11-133	U50	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3	7meg *	½	40X465					Range (AGC)
R4A	1meg	½	40X428	B-69	A47-1meg-S	Q11-137	TA16L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R5	500Ω	2(WW)	40X472		39-500	112-500	FL-500	Buss
R6A	1500Ω	½	40X464-2	AB-6	B47-1500-S	BU-109	PTA1S2L	Vert. Linearity
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R7A	2.5meg	½	40X466-2	AB-83	B47-2.5meg-S	BU-329	SU-585	Height
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

* "STA-LOC" Equivalent: FA52L, RU16L, OF30S2, 1S3S2S, U54L.
* Split Element. Open at 10% rotation, 3000Ω.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	5600Ω	
R9	1meg	
R10	10K	
R11	2.2meg	
R12	22meg	
R13	10K 2W	
R14	560	
R15	22K	
R16	470Ω	
R17	150Ω	
R18	1meg	
R19	360Ω 4W	#43X331
R20	68Ω	
R21	180K	
R22	100K	
R23	100K	
R24	47Ω 10W	
R25	100Ω	
R26	150Ω 1W	

ITEM No.	RATING	REMARKS
R27	470Ω 1W	
R28	33K	
R29	2.2meg	
R30	1.5meg	
R31	680K	
R32	47K	
R33	6800Ω	
R34	4700Ω	
R35	470K	
R36	330K	
R37	22K	
R38	10meg	
R39	2.2meg	
R40	180Ω	
R41	10000 1W	
R42	4700Ω	
R43	18K	
R44	220K	
R45	330K	

ITEM No.	RATING	REMARKS
R46	820K	
R47	82K	
R48	270K	
R49	3900Ω	
R50	68K	
R51	22K	
R52	10K	
R53	220K	
R54	56K	
R55	68Ω	
R56	1meg	
R57	90K 4W	#43X351
R58	150K	
R59	5600Ω	
R60	560Ω	
R61	560Ω	
R62	2500Ω 10W	#43X291
R63	7.5Ω 20W	#43X397 ①
R64	52Ω 20W	#43X302

Coronado Part Number. ① Fusible Type.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	9A3436				62IL		
B	41.25MC Trap							
L2	2nd Video IF	9A3444						
L3A	3rd Video IF	9A2435 ①						
B	Series Peaking Coil		19-3036	19-3036	TV-180	6176		30uh
L4	Series Peaking Coil	9A2375	19-3036	19-3036	TV-180	6176		30uh
L5	Shunt Peaking Coil	36A22	19-3300	19-3300	TV-185	6155		290uh
L6	4.5MC Trap	9A2366	20-1004	20-1004	TV-181	1469	SF-3	
L7	Shunt Peaking Coil	36A37	19-3330	19-3330	TV-200	6132	VP-7	325uh
L8	Series Peaking Coil ③	36A45	19-3375 *	19-3375 *	TV-198 *	6130 *	VP-8 *	270uh
L9	Sound IF	9A2434	17-1026	17-1026				
L10	Quadrature Coil	9A2367	20-1006	20-1006	TV-121	1480		
L11	RF Choke	9A2380	19-1001	19-1001	BC-582	4604		1.5uh

① Includes M3. ② Wound on 5600Ω Resistor. * Parallel with 5600Ω Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordorson PART No.	NOTES
L23	TTQ		9A2466	HS-7	TV-168	62IL	HS-7	Horiz. Osc., Tap ② 22Ω	
L23	58Ω		9A2373	HS-5	MWC-13	6315	H-102	HS-5	Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
L24	.340A	38Ω	.8 Hy.	52X95-2A ①	26C44	C-2996 ②	F-80I ②	C-2343	26C44	C-28X

① Alternate Part #52X95-11. ② Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	Vert. Osc.	54X19A	35A03	A-3003	V405	VB019	A-8125	35A03	A-97X
	Alt. Vert. Osc.	54X19						
T2	Vert. Output	51X207-1A	36S73 ①	A-3955	V307 ①③	V036 ③	VO-106	36S73 ①	A-144X ①
	Alt. Vert. Output	51X207						
T3	Yoke Horiz. (25MH)	9A3458-B					Y-45 ④	Y-45 & NW1 ⑤
	80° Vert. (39MH)	9A2435						
	Alternate Yoke	9A3458						
	Rear Cover and Centering Device	2A435						YC-112
T4	Horiz. Output	53X389						

① Drill new mounting hole(s). ② Connect as Autoformer. ③ Cut and tape red/black lead.
④ Remove jumper from terminal #3 to #6. Connect yoke terminal #1 to plug pin #4; terminals #2 & #7 to plug pin #3; terminal #3 to plug pin #2; terminal #6 to plug pin #1; terminal #4 to plug pin #5. Use original rear cover & centering device.
⑤ Connect yoke terminal #3 to plug pin #4; terminals #2 & #7 to plug pin #3; terminal #1 to plug pin #2; terminal #4 to plug pin #1; terminal #5 to plug pin #5.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T5	6000Ω	3-4Ω	51X206A or 51X206	24S51	A-3026	AU-501	A-3877	24S51	S-6X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: CORONADO PART No.	QUAM PART No.	NOTES
SP1	5"	PM	6-8Ω	12AS50-2	5AI52S6.4	
SP2	8"	PM	6-8Ω	12AS50-2	5AI52S6.4	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA
K1	Audio Coupling	1000mmf, 5000mmf, 680Ω, 330K	76X16	Centralab PC-406
K2	Sync Sep. Grid	150mmf, 270K	76X15	
K3	Vert. Integrator	3000mmf, 5000mmf, 6000mmf, 8200Ω, 8200Ω, 22K	76X7C ①	Aerovox PA-501 Centralab PC-104 Mallory MS-100 Sprague Y-3
K4	Isolation	470mmf, .3-1meg	*	Centralab RC-47I Sprague ACI-1

① Alternate Part #76X7. * Some versions may use individual components in this application.

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	CORONADO PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.340A	66X23 ①	SD500 ①	HA504 ①	40K ①	SR500 ①	① Silicon Type
M2	.240A	66X23 ①	SD500 ①	HA504 ①	40K ①	SR500 ①	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: CORONADO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N60		1N60	1N60	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M4	Tuner	25AU92	VHF
	Tuner	25AU85-3	UHF
	Magnet	2A478	Beam Alignment (May not be used in some models)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

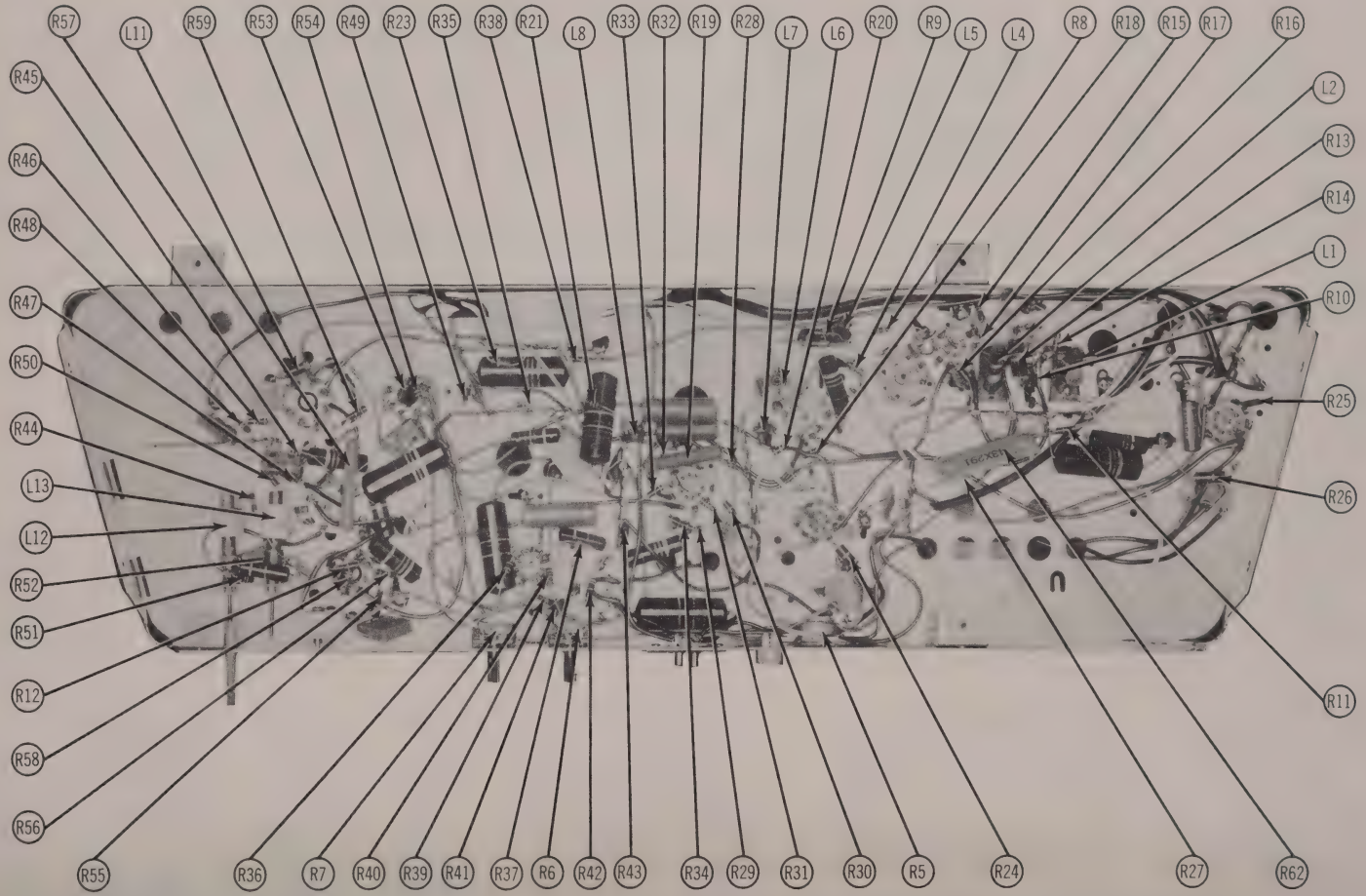
NAME	PART NO.	DESCRIPTION
Safety Glass	17X303-1	Tinted
Knob	10A979-1	Channel Selector
Knob	10A987-1	Fine Tuning
Knob	10A993-1	Off-On, Volume
Knob	10A978-1	Brightness, Vertical, Range
Knob	10A859-1	Contrast
Cabinet Leg	6IX35-1	Right Front, Mahogany
Cabinet Leg	6IX36-3	Left Front, Mahogany
Cabinet Leg	6IX35-3	Rear, Mahogany
Cabinet Leg	6IX35-4	Right Front, Oak
Cabinet Leg	6IX36-4	Left Front, Oak
Cabinet Leg	6IX35-6	Rear, Oak
Cabinet Leg	6IX35-7	Right Front, Walnut
Cabinet Leg	6IX36-8	Left Front, Walnut
Cabinet Leg	6IX35-9	Rear

WIRING DATA

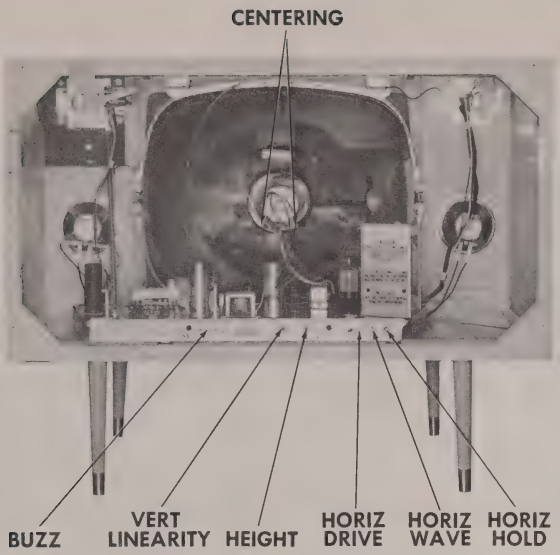
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8585 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8375
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8465 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

CORONADO MODELS TV2-9590 A, -9591 A, -9592 A

FOLDER 1



CHASSIS BOTTOM VIEW - RESISTOR AND INDUCTOR IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a station and adjust the Horizontal Hold until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast control fully counterclockwise and the Brightness control clockwise so that the picture appears washed out. Turn the Horizontal Drive Trimmer (B1) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of the scope to TP-4. Low side to chassis. Adjust the Horizontal Waveform slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. (See Fig. 4.) Keep the picture in sync during this adjustment.

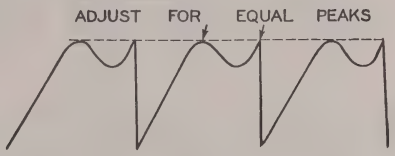
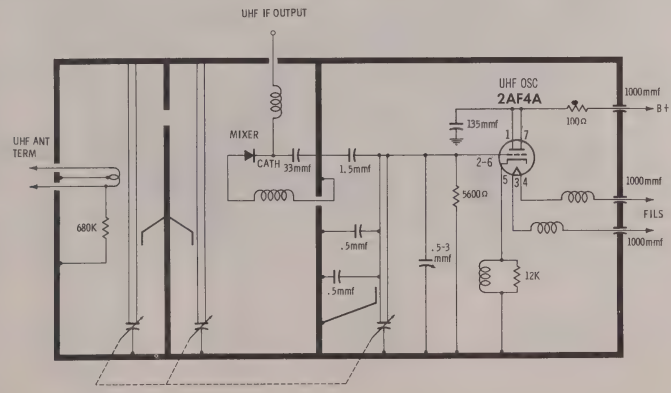


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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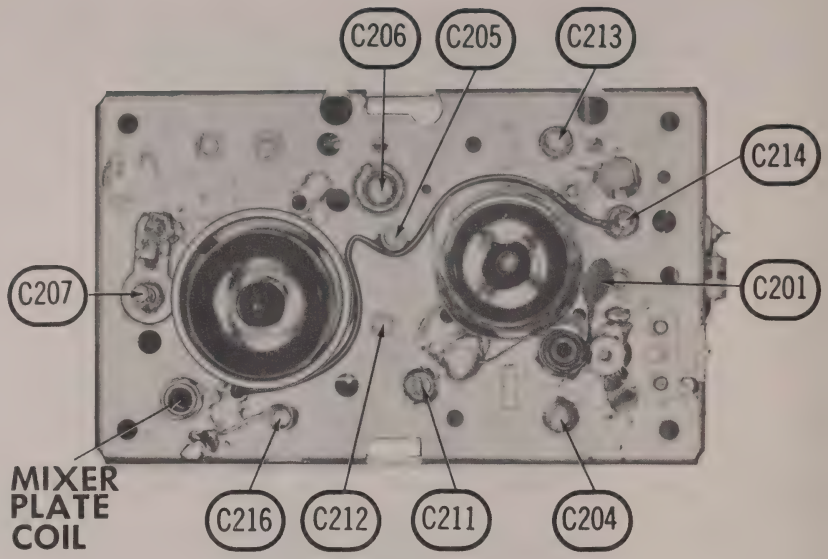
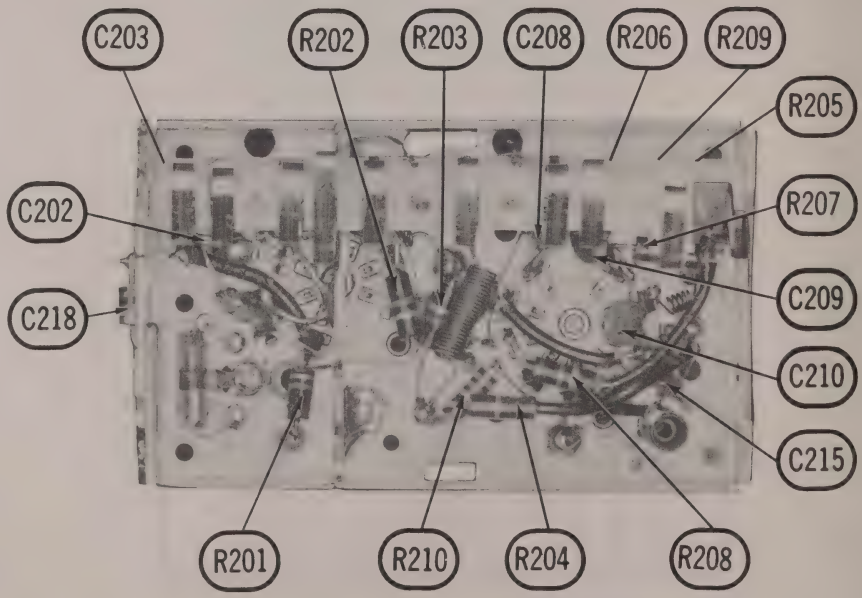
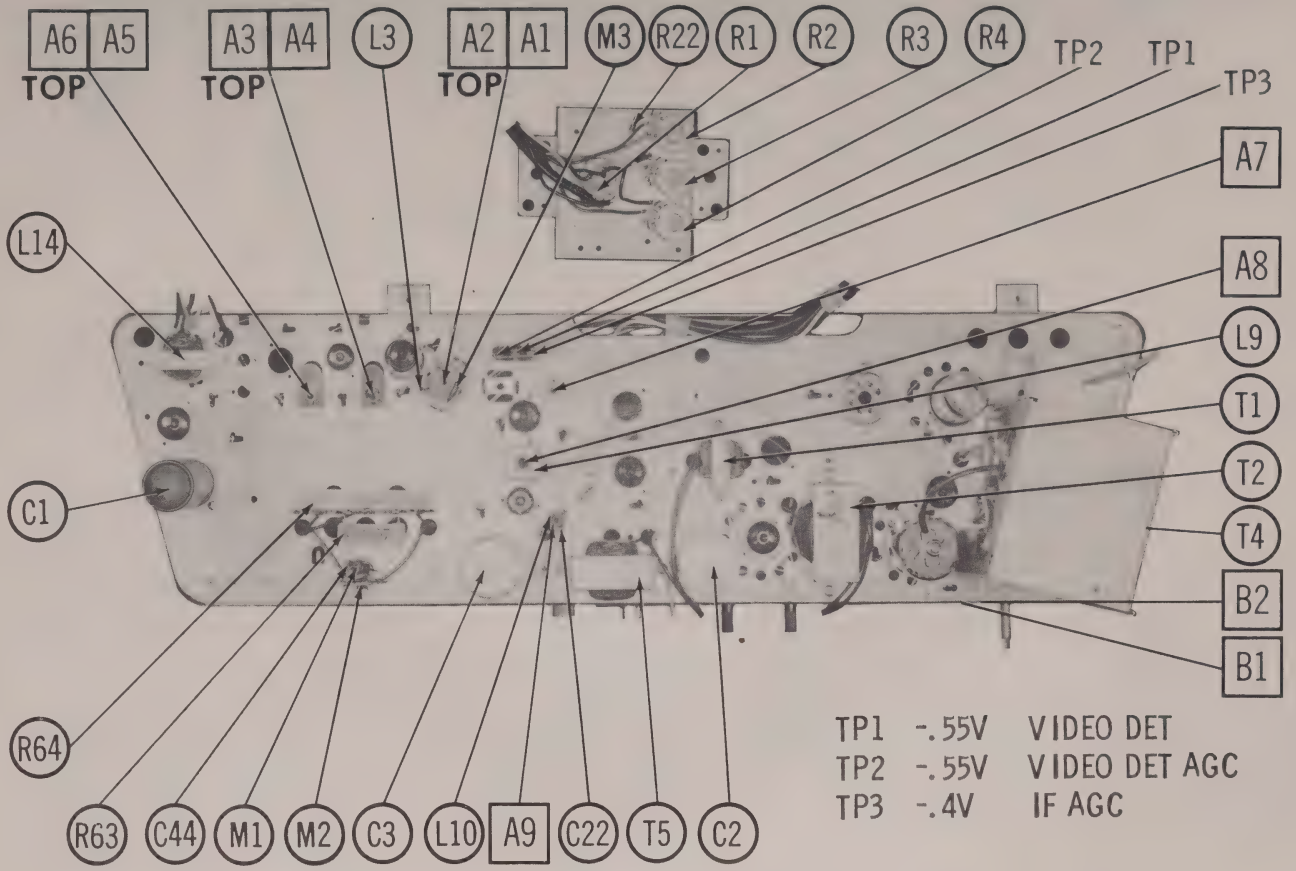
UHF TUNER 25A1193—3



VHF TUNER with UHF Provisions 25A1192 - TOP VIEW



VHF TUNER with UHF Provisions 25A1192 - BOTTOM VIEW

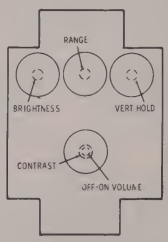


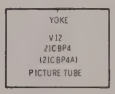
CHASSIS - TOP VIEW

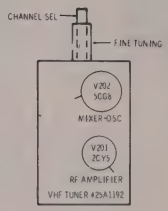
RESISTANCE MEASUREMENTS

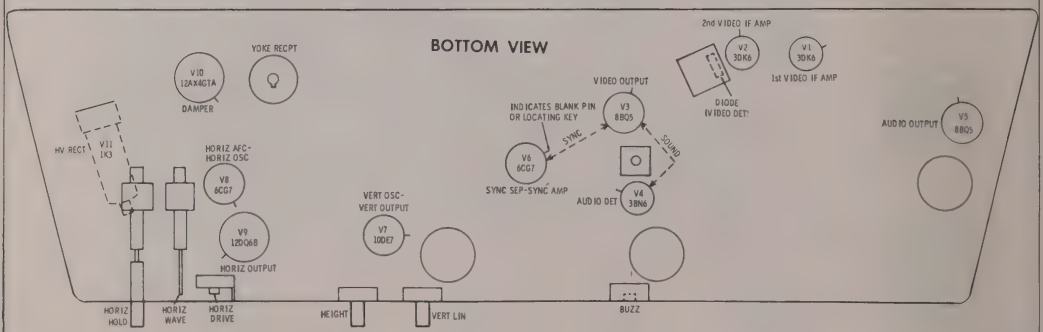
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	800K	56Ω	13Ω	12Ω	†10K	†10K	0Ω		
V2	3DK6	2Ω	150Ω	12Ω	11Ω	†3000Ω	†3000Ω	0Ω		
V3	8BQ5	1meg	1meg	●100Ω	18Ω	16Ω	NC	†3600Ω	NC	†2500Ω
V4	3BN6	●250Ω	6Ω	10Ω	11Ω	†7200Ω	5.8Ω	†330K		
V5	8BQ5	100Ω	100Ω	150Ω	20Ω	18Ω	NC	890Ω	NC	†470Ω
V6	6CG7	†1.5meg	2.2meg	0Ω	15Ω	16Ω	†14K	47K	0Ω	0Ω
V7	10DE7	†440Ω	2.2meg	2.2meg	13Ω	15Ω	●‡2.2meg	●950K	210Ω	●2000Ω
V8	6CG7	†56K	335K	0Ω	6Ω	5Ω	†38Ω	680K	350K	0Ω
V9	12DQ6B	TP	8Ω	TP	†95K	1meg	NC	10Ω	0Ω	TOP CAP †8Ω
V10	12AX4GTA	TP	NC	¶150K	NC	†38Ω	TP	3Ω	5Ω	
V11	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †410Ω
V12	21CBP4	8Ω	●20K	Pin 6 †100K	Pin 10 †10meg	Pin 11 ●290K	Pin 12 6Ω			
V201	2CY5	●12K	0Ω	2Ω	3Ω	†2500Ω	22K	0Ω		
V202	5CG8	15K	†60K	0Ω	2Ω	0Ω	†5000Ω	†50K	0Ω	240K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
‡ MEASURED FROM PIN 3 OF V10.
† MEASURED FROM OUTPUT OF M1.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION TP TIE POINT









TUBE PLACEMENT CHART

PHOTOFACT® Folder

ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL E1416G (Ch. 16E20)

ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL E1416G

1. Remove 2 push-on type knobs in front and 3 push-on type knobs on side of cabinet.
2. Remove metal screw holding rear cover. Remove rear cover.
3. Remove picture tube socket, yoke, hi voltage lead, and speaker leads.
4. Remove 2 screws holding the volume control mounting bracket.
5. Remove 2 screws holding tuner mounting bracket.
6. Remove 4 chassis bolts at bottom of cabinet.
7. Pull chassis straight out.

PICTURE TUBE REMOVAL

1. It is necessary to remove the chassis for picture tube removal. See "Chassis Removal".
2. Remove 2 screws holding picture tube mounting bracket to chassis.
3. Pull picture tube straight out.

MODEL E1416G (Ch. 16E20)

TRADE NAME	ZENITH	MODELS	CHASSIS
		E1416G, E1801B, E1801L, E1803C, E1803L	16E20
		E1416GU, E1801BU, E1801LU, E1803CU, E1803LU	16E20U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF - Sixteen, UHF - Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 180 Watts, 1.6 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove front knobs (push-on type) and remove 2 screws on each side holding the metal strip around safety glass. Tilt glass out and remove.

FUSE

A fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)
A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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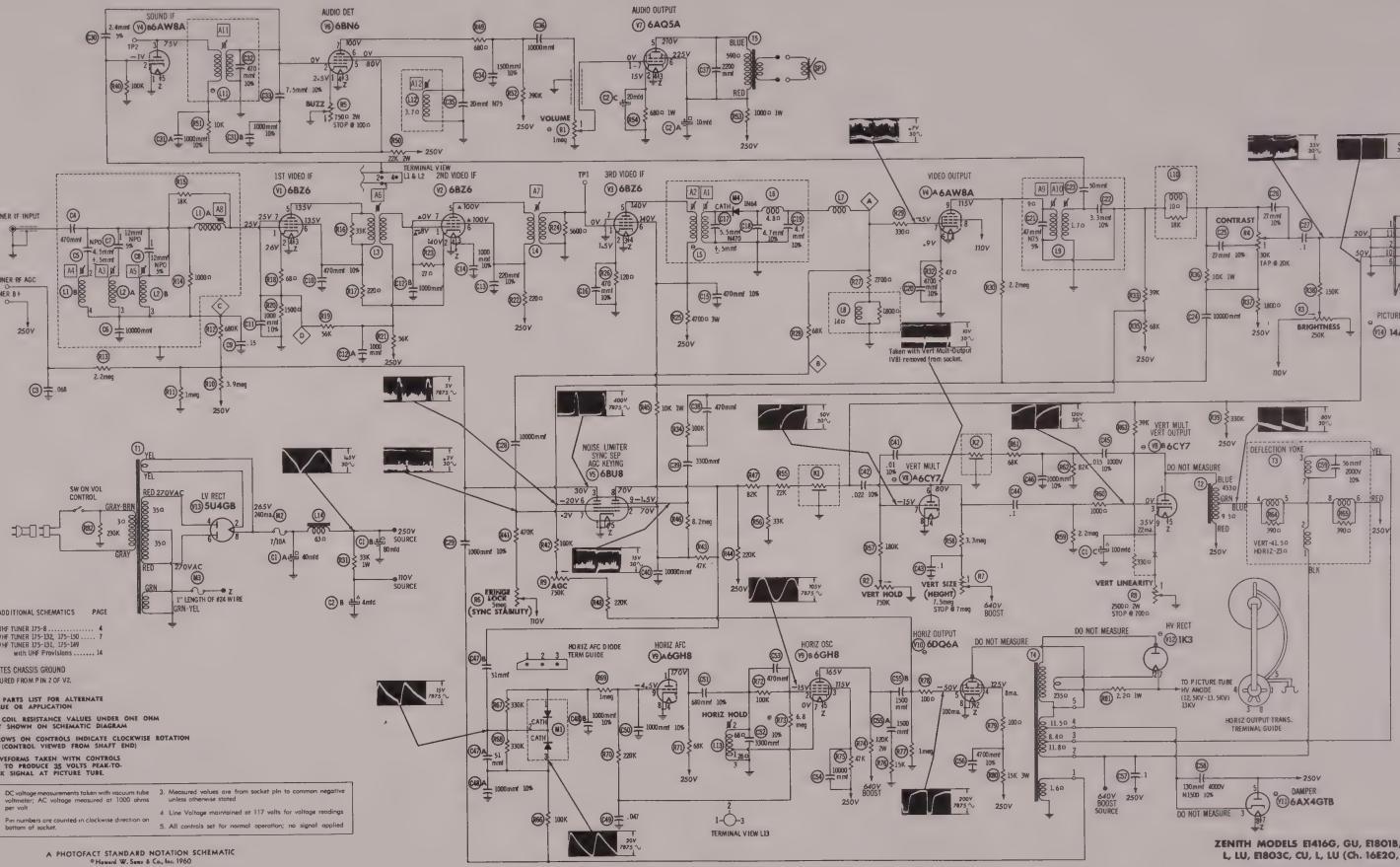
SOUND IF
V4 6AW8A
AUDIO DET
V5 6BN6
AUDIO OUTPUT
V7 6AQ5A
VOLUME
TERMINAL VIEW
1ST VIDEO IF
V1 6BZ6
2ND VIDEO IF
V2 6BZ6
3RD VIDEO IF
V3 6BZ6
TUNER IF INPUT
TUNER RF AGC
TUNER B+
VIDEO OUTPUT
V4A 6AW8A
CONTRAST
PICTURE TUBE
14AUP4
BRIGHTNESS
Taken with Vert Mult Output tube removed from socket.
NOISE LIMITER SYNC SEP AGC KEYING
V6 6BU8
VERT MULT
V8 6CY7
VERT MULT VERT OUTPUT
V9 6CY7
DEFLECTION YOKE
SW ON VOL CONTROL
LV RECT
V13 5U4GB
RED 270VAC
GRN
GRAY-BRN
GRAY
RED
270VAC
1" LENGTH OF #24 WIRE
GRN-YEL
250V SOURCE
110V SOURCE
FRINGE LOCK
(SYNC STABILITY)
AGC
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
HORIZ AFC DIODE
V9 6GH8
HORIZ AFC
HORIZ OSC
V9 6GH8
HORIZ OUTPUT
V10 6DQ6A
HORIZ HOLD
HV RECT
V12 1K3
TO PICTURE TUBE HV ANODE (12.5KV - 13.5KV) 1.2KV
HORIZ OUTPUT TRANS. TERMINAL GUIDE
DO NOT MEASURE
640V BOOST
640V BOOST SOURCE
AMPHER
V11 6AX4GTB
TERMINAL VIEW L13
ADDITIONAL SCHEMATICS PAGE
UHF TUNER 175-8 4
VHF TUNER 175-132, 175-150 7
VHF TUNER 175-151, 175-149 with UHF Provisions 14
DENOTES CHASSIS GROUND
MEASURED FROM PIN 2 OF V2.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC CON. RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 25 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation; no signal applied
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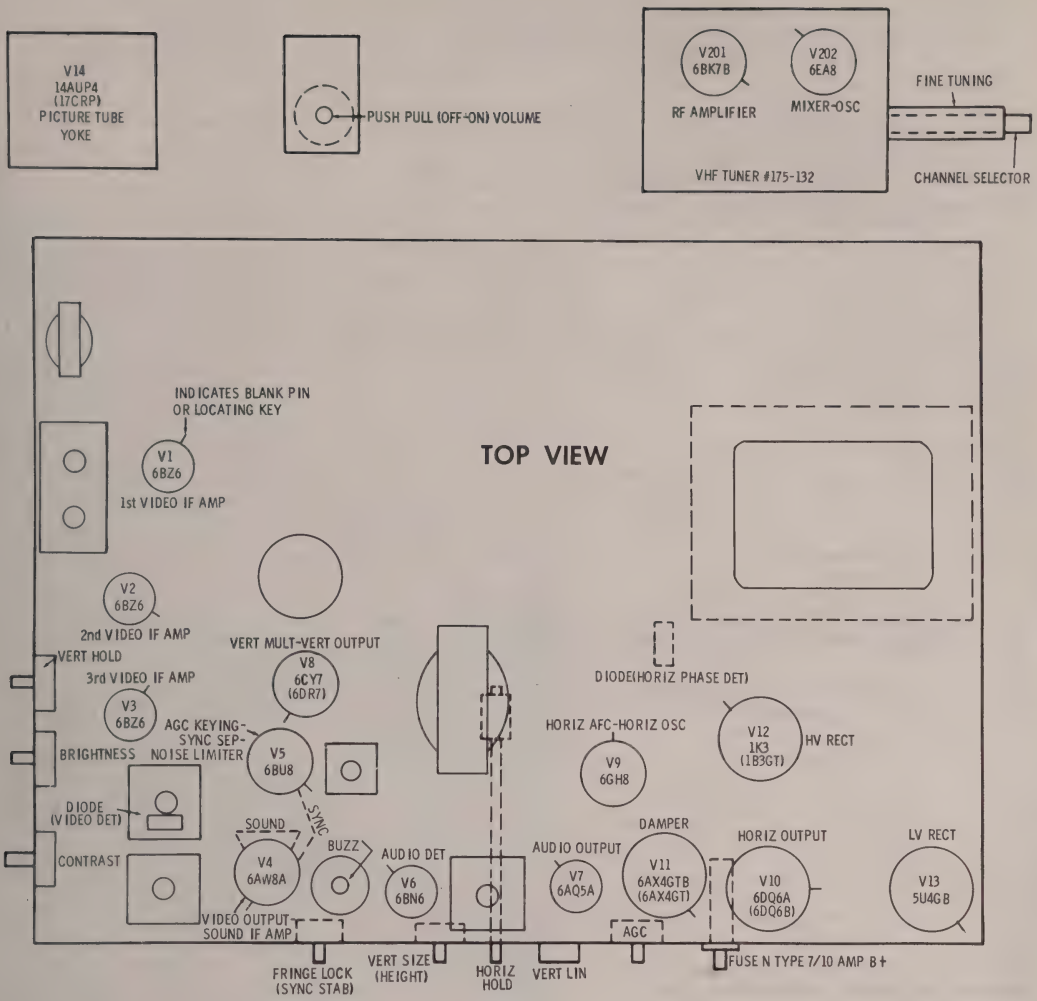
ZENITH MODELS E1416G, GU, E1801B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V13, Fuse (B+), Fuse (Fil.)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V10, V11, V13
Vert. off freq. V8
Horiz. off freq. V9, Diode (Horiz. Phase Det.)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, Diode (Horiz. Phase Det.)
No vert. or horiz. sync V5

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to TP-1. Low side to chassis.	44.0MC (10MC Swp)	39.75MC 41.25MC 45.75MC	Between two channels	Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load)	A1, A2	Set sweep output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, see that the cores are entering their respective windings from opposite ends.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5	Connect a clip lead from point (B) to chassis. Connect a clip lead from point (C) to point (D). Use high scope gain and adjust A3 thru A5 for MINIMUM amplitudes at markers as shown in Fig. 2. A3 controls 39.75MC, A4 controls 41.25MC and A5 controls 47.25MC.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8, & Mixer Plate Coil	Disconnect the clip lead from point (D) and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A6 affects the low frequency side and A7 affects the high frequency side.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver terminals.
Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the Audio Detector as evidenced by a hiss similar to super-regeneration in the sound. Adjust A9, A10, A11 and A12 for maximum sound and best quality. Adjust the Buzz control for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 9

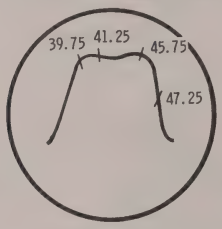


FIG.1

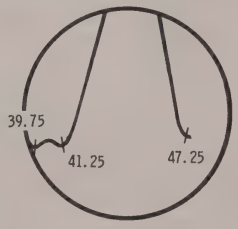


FIG.2

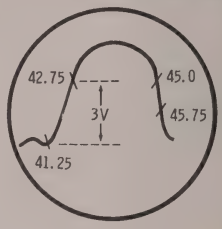
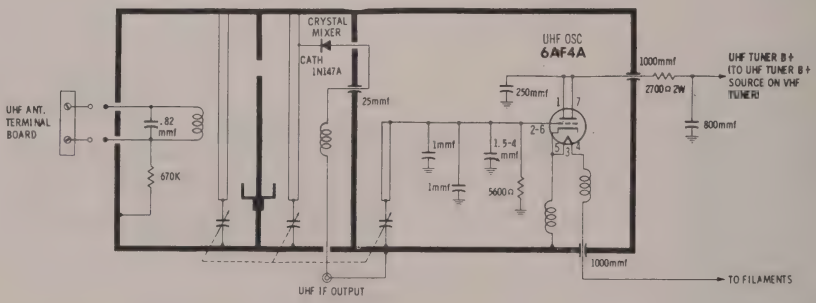


FIG.3



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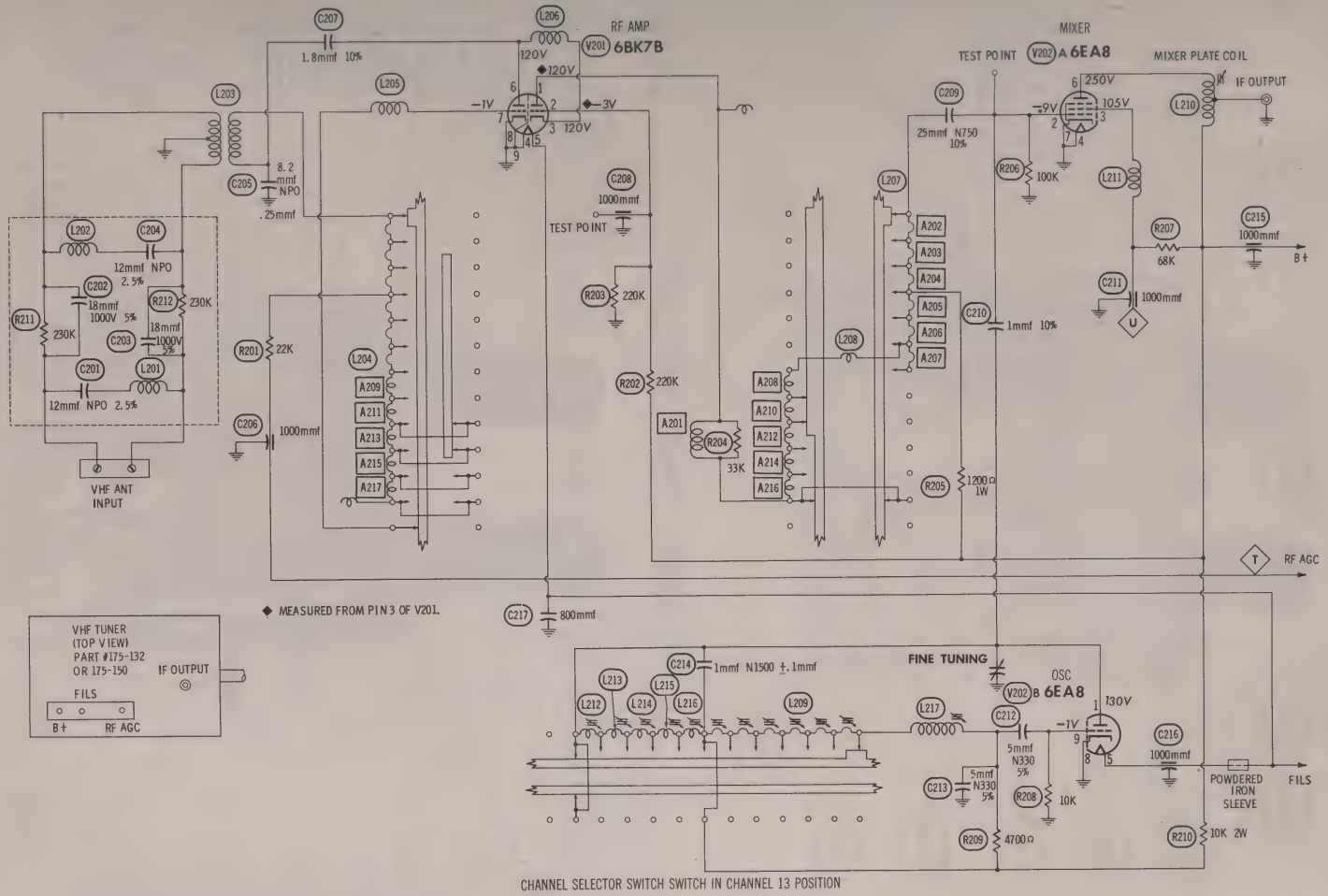
UHF TUNER 175-8

CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

CHASSIS BOTTOM VIEW – CAPACITOR & MISC. IDENT.



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VHF TUNER 175-132, 175-150

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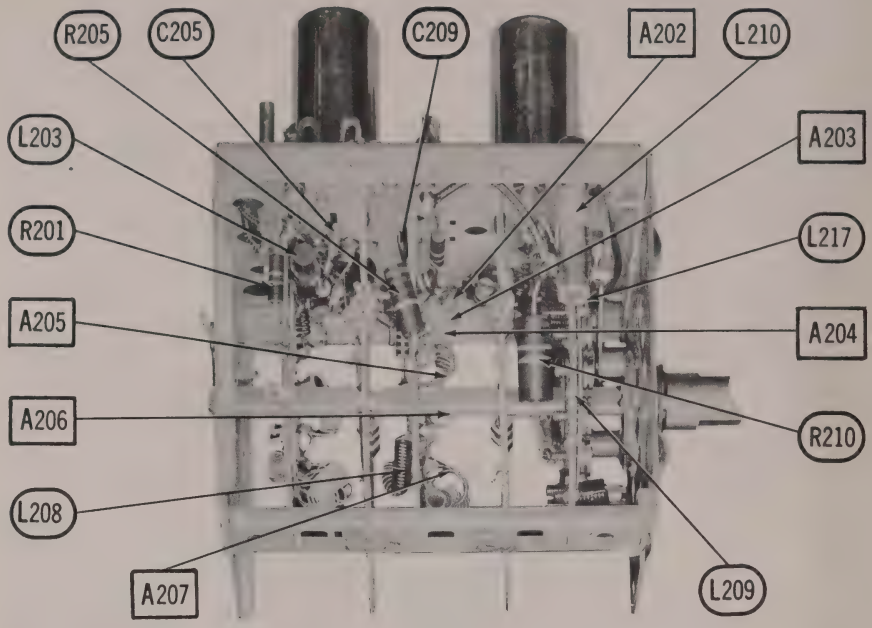
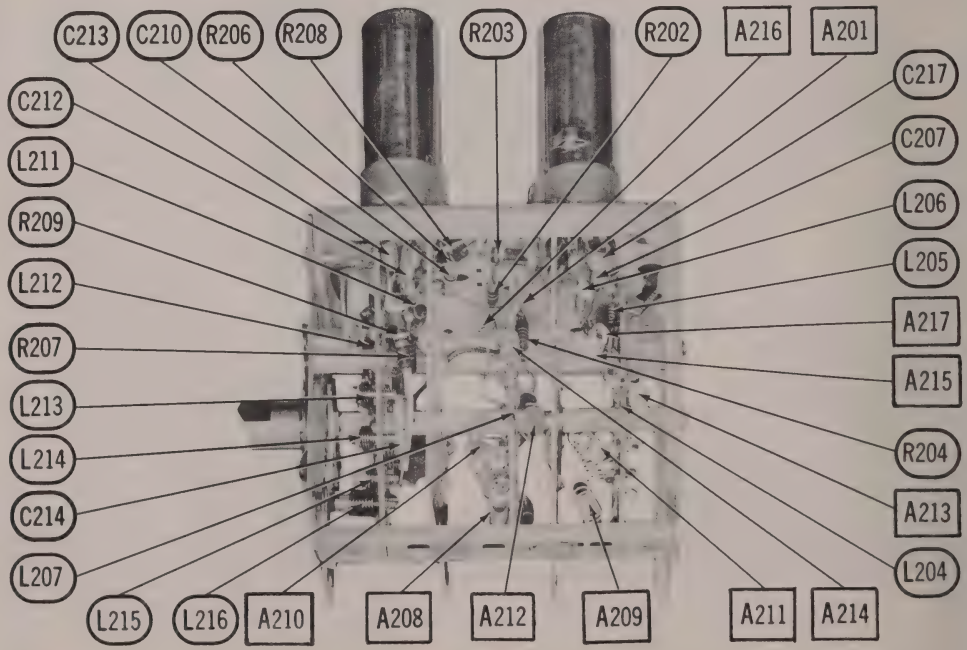


VHF TUNER 175-132 - LEFT SIDE



VHF TUNER 175-132 - RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS

175-131, -132, -149, -150

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

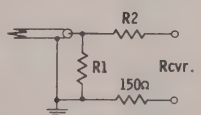
VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range by turning the Fine Tuning shaft until the small index hole in the drive cam is directly over the small hole just below the channel 13 oscillator adjustment screw. Starting with the highest channel operating in the area, adjust the appropriate oscillator adjustment screw for best picture and sound for each channel available.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usuable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. amp. thru 10K to point ⓣ. Low side to chassis.	A201	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown.
2.	"	"	207MC	205.25MC 209.75MC	12	"	A202	"
3.	"	"	201MC	199.25MC 203.75MC	11	"	A203	"
4.	"	"	195MC	193.25MC 197.75MC	10	"	A204	"
5.	"	"	189MC	187.25MC 191.75MC	9	"	A205	"
6.	"	"	183MC	181.25MC 185.75MC	8	"	A206	"
7.	"	"	177MC	175.25MC 179.75MC	7	"	A207	"
8.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust first coil for proper marker position and second coil for maximum gain and symmetry.
9.	"	"	79MC	77.25MC 81.75MC	5	"	A210, A211	"
10.	"	"	69MC	67.25MC 71.75MC	4	"	A212, A213	"
11.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215	"
12.	"	"	57MC	55.25MC 59.75MC	2	"	A216, A217	"



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

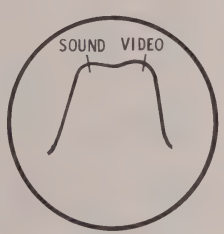


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp.	6BZ6
V4	Video Output - Sound IF Amp.	6AW8A
V5	AGC Keying - Sync Sep. - Noise Inverter	6BU8
V8	Audio Det.	6BN6
V7	Audio Output	6AQ5A
V8	Vert. Mult. - Vert. Output	6CY7 (6DR7) *
V9	Horiz. AFC - Horiz. Osc.	6GH8
V10	Horiz. Output	6DQ6A (6DQ6B) * 6AX4GTB (6AX4GT)* 1B3 (1B3GT) *
V11	Damper	
V12	HV Rect.	
V13	LV Rect.	5U4GB

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V14	14AUP4 17CRP4			14AUP4 ① 17CRP4 ①	14AUP4 ③ 17CRP4 ③	① Aluminized ③ Silver Screen "86"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	⌀40	400	23-3123	AFH4-67-93	C0890	FP333.2	TMT-109	TVL-4663.4	
B	⌀80	400							
C	⌀100	50							
C2A	⌀10	400	23-3744	AFH3-180	C1445	FP868.68	TMT-217	TVL-3655	
B	⌀4	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.068	200V		P288N-068		CD5G068	4DP-3-683	GEM-6168	4TM-368
C4	4.5			BPD-00047	DT-4T1	BYA0P47	CCD-471	B-347	10TS-T47
C5	4.5	NPO ± .5mmf		NPO-SI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C6	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-R10
C7	13	NPO	5%			TCZ-13	C10Q13C	CNO-413	10TCC-Q13
C8	12	NPO	5%			TCZ-13	C10Q13C	CNO-412	10TCC-Q13
C9	.15	200V		P288N-15		CUB2P15	3DP-3-154	GEM-3015	2TM-P15
C10	470		10%	DI-470	DD-4T1		CCD-471	B-347	10TS-T47
C11	1000		10%	DI-1000	DD-102	FM8DX	CCD-102	B-310	10TS-D10
C12A	1000			BPD-XX001	DD3-102	BYD6D1	CCD-102 CCD-102	B2X110	5HK-XX01
B	1000								
C13	330		10%	1469-00022		1R5T223	CM-19B-221K	CNO-332	M8-333
C14	1000		10%	DI-1000	DD-103	1R5T1	CCD-103	GP310	10TCC-D10
C15	470		10%	DI-470		5R5T47	CM-19B-471K	MCJ246	M8-347
C16	470		10%	DI-470	DD-4T1	5R5T47	CCD-471	GP347	10TS-T47
C17	5.5	N470 ± .5mmf	#23-3121						
C18	4.7		10%	NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C19	4.7		10%	NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C20	4700		10%	DI-4700		FM6D47	CCD-472	JL-347	10TS-D47
C21	47		NT5		#23-3457				
C22	3.3		10%	NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-333	10TCC-V33
C23	50			SI 50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C24	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-R10
C25	27		10%	NPO-SI 27	DT-270	L10Q27	CCD-270	GP427	10TS-Q27
C26	27		10%	NPO-SI 27	DT-270	L10Q27	CCD-270	GP427	10TS-Q27
C27	.1	200V		P288N-1		DF-104	CUB2P1	3DP-3-104	GEM-301	2TM-P1
C28	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-R10
C29	1000		10%	DI-1000	DD-102		CCD-102	GP310	10TS-D10
C30	3.4		5%	NPO-SI 3.3	TCZ-2R2	C10V32C	CCTO-2R2	CNO-522	10TCC-V22
C31A	1000		10%	DI-1000	DD-102	FM8DX	CCD-102	GP310	10TS-D10
B	1000		10%	DI-1000	DD-103		CCD-103	GP310	10TS-D10
C32	470		10%	DI-470		5R5T47	CM-19B-471K	MCJ344	M8-347
C33	7.5		10%	NPO-SI 8.2	DD-7R5	L10V8		GP580	10TS-V75
C34	1500		10%	DI-1500	DD-152	FM8DX5	CCD-152	GP215	10TS-D15
C35	20	N75			#23-3139				
C36	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-R10
C37	2200			BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C38	470			BPD-00047	DD-4T1	BYA10T47	CCD-471	B-347	10TS-T47
C39	3300			BPD-00033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C40	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-R10
C41	.01	200V	10%	VS4C2S3-10%			FM4S8	GEM-1631	4TM-S3
C42	.022	400V	10%	VS4C4S23-10%			FM4S23	4DP-3-223	GEM-1613	4TM-S23
C43	.1	600V		P568N-1		DF-104	CUB6P1	6DP-4-104	GEM-501	6TM-P1
C44	.1	400V		P488N-1		DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C45	.015	1000V	10%					16DP-3-153	GEM-1611	10TM-S15
C46	1000		10%	DI-1000	DD-102		1R5D1	CCD-102	GP310	10TS-D10
C47A	51			DI-50	DD-510		L10Q51	CCD-500	GP450	10TS-Q50
B	51			DI-50	DD-510		L10Q51	CCD-500	GP450	10TS-Q50
C48A	1000		10%	DI-1000	DD-102		FM8DX	CCD-102	GP310	10TS-D10
B	1000		10%	DI-1000	DD-102		FM8DX	CCD-103	GP310	10TS-D10
C49	.047	200V		P288N-047		DD-503	CUB2S47	3DP-3-473	GEM-4147	2TM-S47
C50	1000		10%	DI-1000	DD-102		FM8DX	CCD-102	GP310	10TS-D10
C51	680		10%	1469-00068			1R5T68	CM-19B-681K	MCJ349	M8-368
C52	3300		10%	1469-0033			1R5D33	CM-30B-332K	MCJ462	M8-333
C53	470		10%	BPD-00047	DD-4T1		5R5T47	CCD-471	B-347	10TS-T47
C54	10000			BPD-01	DD-103		BYA10S	CCD-103	B-110	5HK-R10
C55A	1500			BPD-2X001	DD5-152		BYSCD1D5	CCD-152 CCD-152	B2X215	5HK-2D15
B	1500									
C56	4700		10%	DI-4700			FM6D47	CCD-472	JL-347	10TS-D47
C57	.1	600V		P568N-1		DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C58	130	4000V NI500	10%	#23-3697						
C59	56	2000V	10%				HVA30066			2DY-456

Zenith Part Number.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	63-4681			B11-137	PP18L	Volume Note 1
B	Shaft					SK8	DS-37	
C	Switch					Not Req.	Not Req.	Push-Pull, Off-On
R2A	750K	½	63-3283	AB-86	A47-750K-S	B11-136	PTA784L	Vert. Hold
B	Shaft			AK-19	KS8-3	TM4	Not Req.	
R3A	250K	½	63-4049	B-50	A47-250K-S	Q11-130	TA354L	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	TM4	Not Req.	
R4	90K 20K Tap	½	63-4076			B11-141	UT-415	Contrast
R5	750Ω 100Ω Stop	2(WW)	63-3284		39-800 *	112-800 *	Not Req. FL-750 *	Buss Control
R6A	5meg	½	63-4050	AB-87	B47-5meg-S	B11-141	PTA58L	Fringe Lock (Sync Stability)
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R7A	7.5meg 1meg Stop	½	63-4647	AB-90 **	B47-7.5meg-S **	B11-142 **	SU-89 **	Vert. Size (Height)
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R8	2500Ω 700Ω Stop	2(WW)	63-4446		39-3000-700	112-2500-700	FL-2.5K †	Vert. Linearity
R9A	750K	½	63-3282	AB-86	A47-750K-S	B11-136	PTA784L	AGC
B	Shaft			AK-19	KS8-3	TM4	Not Req.	

† Use 680Ω series Resistor. * Use 100Ω series Resistor.
** Use 470K Resistor in series with right hand terminal viewed from shaft end terminals down.
Note 1. Some versions may use 1meg volume with switch (Part #63-4062).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	3.9meg	
R11	1meg	
R12	680K	
R13	2.2meg	
R14	1000Ω	
R15	18K	
R16	33K	
R17	220Ω	
R18	68Ω	
R19	56K	
R20	1500Ω	
R21	56K	
R22	220Ω	
R23	27Ω	
R24	5600Ω	
R25	4700Ω 3W	
R26	120Ω	
R27	2700Ω	
R28	68K	
R29	330Ω	
R30	2.2meg	
R31	33K 1W	
R32	47Ω	
R33	39K	
R34	100K	

ITEM No.	RATING	REMARKS
R35	68K	
R36	10K 1W	
R37	1800Ω	
R38	150K	
R39	330K	
R40	100K	
R41	470K	
R42	100K	
R43	47K	
R44	220K	
R45	10K 1W	
R46	5.6meg	
R47	82K	
R48	220K	
R49	680K	
R50	22K 2W	
R51	10K	
R52	390K	
R53	1000Ω 1W	
R54	680Ω 1W	
R55	22K	
R56	33K	
R57	3.3meg	
R58	3.3meg	
R59	2.2meg	

ITEM No.	RATING	REMARKS
R60	1000Ω	
R61	68K	
R62	82K	
R63	39K	
R64	390Ω	
R65	390Ω	
R66	100K	
R67	330K	
R68	330K	
R69	1meg	
R70	220K	
R71	68K	
R72	100K	
R73	6.8meg	
R74	1200Ω 2W	
R75	47K	
R76	18K	
R77	1meg	
R78	100Ω	
R79	100Ω	
R80	15K 3W	
R81	2.2Ω 1W	
R82	220K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	S-48045 ①						
B	41.25MC Trap							
L2A	39.75MC Trap	S-41683						
B	47.25MC Trap							
L3	2nd Video IF	S-42874	17-4523 †	17-4523 †	TV-130 †	6234 †	VP-3 †	
L4	3rd Video IF	S-42839	17-4523 †	17-4523 †	TV-130 †	6234 †	VP-3 †	
L5	4th Video IF	S-47698 ③						
L6	Series Peaking Coil	S-41879	19-3093	19-3093	TV-131	6177	VP-3	90uh
L7	HF Choke	S-41688	19-1004	19-1004	BC-565	6810		6uh
L8	Shunt Peaking Coil	S-47906 ③	19-4400 *	19-4400 *	TV-302 *	6136 *		412uh
L8A	4.5MC Trap	S-42872 ③						
B	1st Sound IF	S-47905 ③						
L10	Series Peaking Coil	S-47905 ③	19-3350 ▲	19-3350 ▲	TV-135 ▲	6181 ▲	VP-6 ▲	226uh
L11	2nd Sound IF	S-53547 ③						
L13	Quadrature Coil	S-45239	20-1005	20-1005	TV-121	1480		

① Assembly Part #6-48046.
③ Assembly Part #6-47907, Includes L6.
④ Wound on 1800Ω Resistor.
⑤ Alternate Part #6-47907.
⑥ Wound on 18K Resistor.
⑦ Alternate Part #6-42876.
† Drill new mounting hole.
* Parallel with 1800Ω Resistor.
▲ Parallel with 18K Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L13	94Ω		S-45879	HS-7	TV-165			HS-7	Tap ⑤ 25Ω

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ^(-1)	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	.340A	63Ω	.4 Hy.	95-1581				C-2343		C-24X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	340VCT	5V	95-1649						
	② 1.6A	② 340A	② 3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3V									
	② 7.5A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	95-1646	A-3821 ③	V316 ③	V035 ③	A-8149	26S71 ①	26S71 ①	A-13JX
T3	Yoke Horiz. (12MH) (90°) Vert. (37MH)	95-1648	T90F13/47 ③④⑤	MDF-91 ④⑤⑥	PCM1045 ④⑤⑥	DY-13A ④⑤⑥	Y-39 ③④⑤	Y-39 ③④⑤	Y-40 & NW24 ③ YC-1
	Rear Cover and Centering Device Horiz. Output	S-23237 *							
T4		S-45510							

* Part of T3.
① Drill new mounting hole. Connect as autoformer.
② Cut and tape green lead.
③ Connect yoke terminal #2 to horiz. output trans. terminal #2; yoke terminal #7 to horiz. output terminal #2 with damping capacitor across yoke terminal #2 and #1.
④ Use original yoke damping network, if necessary.
⑤ Use original rear cover and centering device.
⑥ Cut and form a piece of .010 gauge fish paper inside the yoke itself to provide insulation between width sleeve and yoke proper.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4500Ω	3-4Ω	95-1647	24S48 ①	A-3026 ①			24S48 ①	S-6X ①	① Use original frame.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	49-858	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No	REPLACEMENT DATA
K1	Vert. Integrator		87-5	Sprague V-15
K3	Vert. Feedback		87-4	Sprague V-14

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ZENITH PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		103-20 *	SD-91 *	K1615 *			* Dual Selenium Diode * Silicon Type (2 Req'd)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	N	7/10A 250V 3/9	136-38	62-21	333, 750 (N 7/10A 250V 3/9)	346010	N 7/10	HN½ to 3/4
M3	1" length of #24 wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ZENITH PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4	1N84	103-23	1N80	1N80	1N84	Video Det. (Pigtail)

ZENITH MODELS E1416G, GU, E1809B, BU, L, LU, E1803C, CU, L, LU (Ch. 16E2U, U)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	175-132	VHF, Models E1416G, E1803C, E1803L STANDARD COIL Replacement Part #GG-4290/A
	Tuner	175-150	VHF, Models E1801B, E1801L
	Tuner	175-131	VHF with UHF Provisions, Models E1416GU, E1803CU, E1803L
	Tuner	175-149	VHF with UHF Provisions, Models E1801BU, E1801LU
	Tuner	175-8	UHF
M6	Antenna	S-43820	JFD Replacement Type #TA380, Models E1416G, GU
	Antenna	S-46769	JFD Replacement Type #TA373, Models E1803C, CU, L, LU

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-258	Models E1416G, GU
Safety Glass	192-259	Models E1801B, BU, L, LU, E1803C, CU, L, LU
Knob	46-2129	Channel Selector, Models E1416G, GU
Knob	S-49299	Channel Selector, Models E1801B, BU, E1801L, LU
Knob	46-2004	Channel Selector, Models E1803C, CU, E1803L, LU
Knob	S-40431	Fine Tuning, Models E1416G, GU
Knob	S-49154	Fine Tuning, Models E1801B, BU, E1801L, LU
Knob	S-43768	Fine Tuning, Models E1803C, CU, E1803L, LU
Knob	S-45485	UHF Dial, Model E1416GU
Knob	S-43927	UHF Dial, Models E1801BU, E1801LU, E1803CU, E1803LU
Knob	46-2408	Volume, Models E1416G, GU
Knob	S-49153	Volume, Models E1801B, BU, E1801L, LU
Knob	S-43493	Volume, Models E1803C, CU, E1803L, LU
Knob	S-44381	Brightness, Vertical Hold & Contrast, Models E1416G, GU
Knob	S-44382	Brightness, Vertical Hold & Contrast, Models E1801B, BU, E1801L, LU, E1803C, CU, E1803L, LU
Knob	S-46215	Horizontal Hold, All Models
Cabinet	14-2576	Models E1416G, GU
Cabinet	14-3099	Model E1801B
Cabinet	14-3104	Model E1801BU
Cabinet	14-3098	Model E1801L
Cabinet	14-3103	Model E1801LU
Cabinet	14-3101	Model E1803C
Cabinet	13-3106	Model E1803CU
Cabinet	14-3100	Model E1803L
Cabinet	14-3105	Model E1803LU

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

175—132 , 175—150

TUBES

• CBS •		GENERAL ELECTRIC •		• RAYTHEON •		• SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V201	RF Amp.	6BK7B	V202	Mixer - Osc.	6EA8		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	12 NPO 2.5%	#22-2679		TCZ-12				
C202	18 1000V 5%				C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C203	18 1000V 5%				C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C204	12 NPO 2.5%	#22-2679		TCZ-12				
C205	8.2 NPO .25mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C206	1000		EF-001	MFT-1000		CCF-102	CT280A	
C207	1.8 10%		NPO-SI 2.0		C10V2C			10TCC-V18
C208	1000		EF-001	MFT-1000		CCF-102	CT280A	
C209	25 N750 10%		N750-DI 25	DTN-25	C10Q25U	CCTN-270	CN7-427	10TCU-Q25
C210	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	5 N330 5%	#22-2716				*		
C213	5 N330 5%	#22-2716				*		
C214	1 N1500 ±.1mmf	#22-2714						
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	800		BPD-0008	DD-801	L10T8	CCD-801	B-382	10TS-T80

Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	22K	
R202	220K	
R203	220K	
R204	33K	

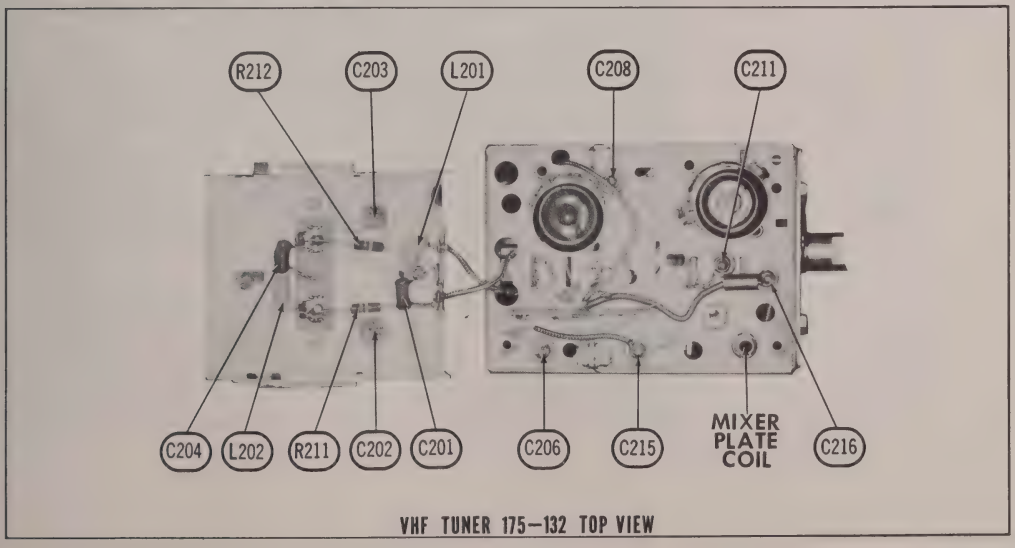
ITEM No.	RATING	REMARKS
R205	1200Ω 1W	
R206	100K	
R207	65K	
R208	10K	

ITEM No.	RATING	REMARKS
R209	4700Ω	
R210	10K 2W	
R211	230K	
R212	230K	

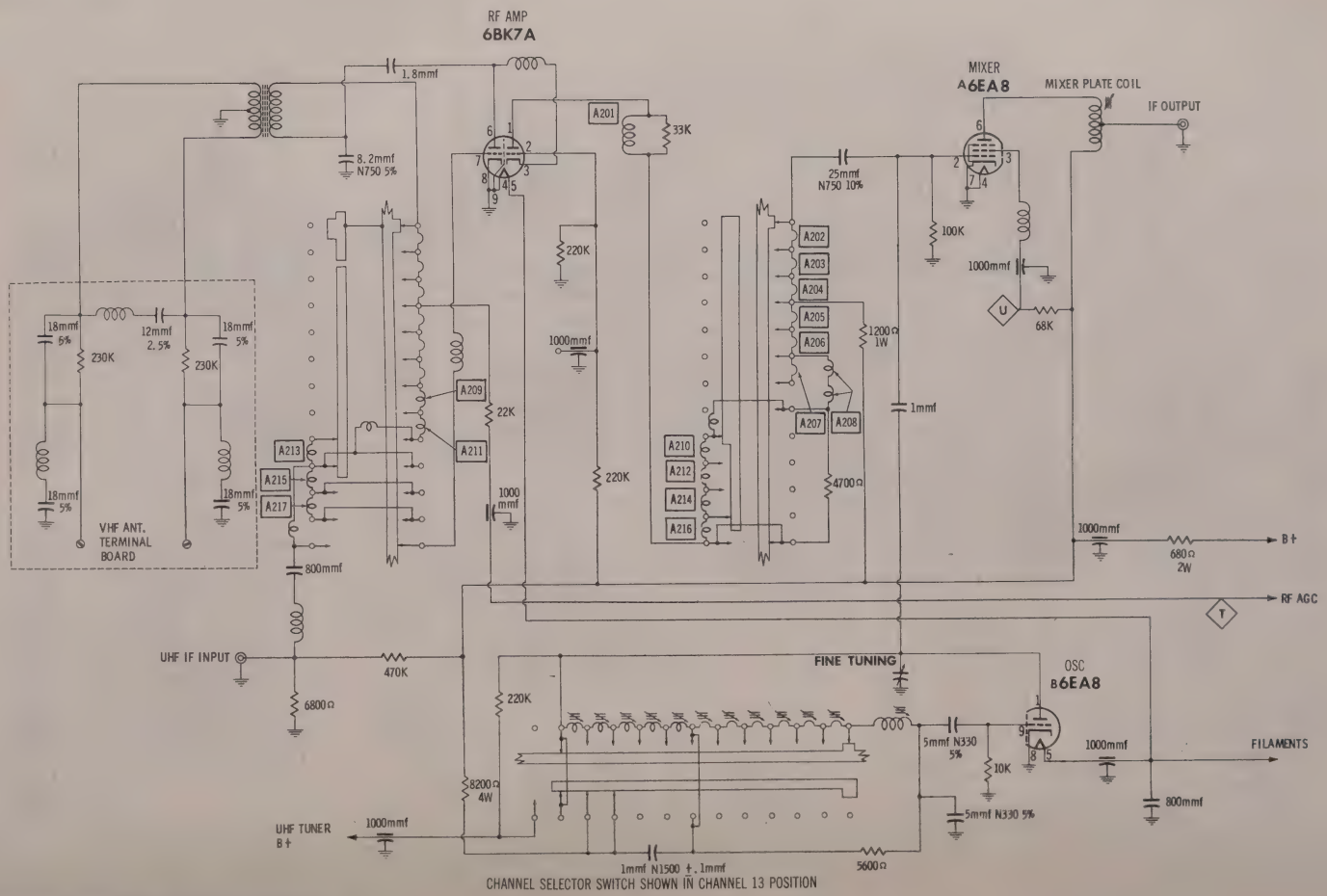
COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	RF Choke	20-567	
L202	RF Choke	20-567	
L203	Ant. Trans.	S-24645	
L204	Ant. Coils	S-43341	Channel 2 thru 12, Includes Wafer Assembly
L205	Ant. Coil	20-600	Channel 13
L206	RF Choke	20-633	
L207	RF Coils	S-23640	Channel 2 thru 12, Includes Wafer Assembly
L208	RF Choke	20-579	

ITEM No.	USE	ZENITH PART No.	NOTES
L209	Osc. Coils	S-41807	Channel 2 thru 13, Includes Wafer Assembly
L210	Mixer Plate Coil	S-43490	
L211	RF Choke	20-632	
L212	Osc. Coil	20-662	Channel 2
L213	Osc. Coil	20-663	Channel 3
L214	Osc. Coil	20-664	Channel 4
L215	Osc. Coil	20-665	Channel 5
L216	Osc. Coil	20-666	Channel 6
L217	Osc. Coil	20-667	Channel 13



VHF TUNER 175—132 TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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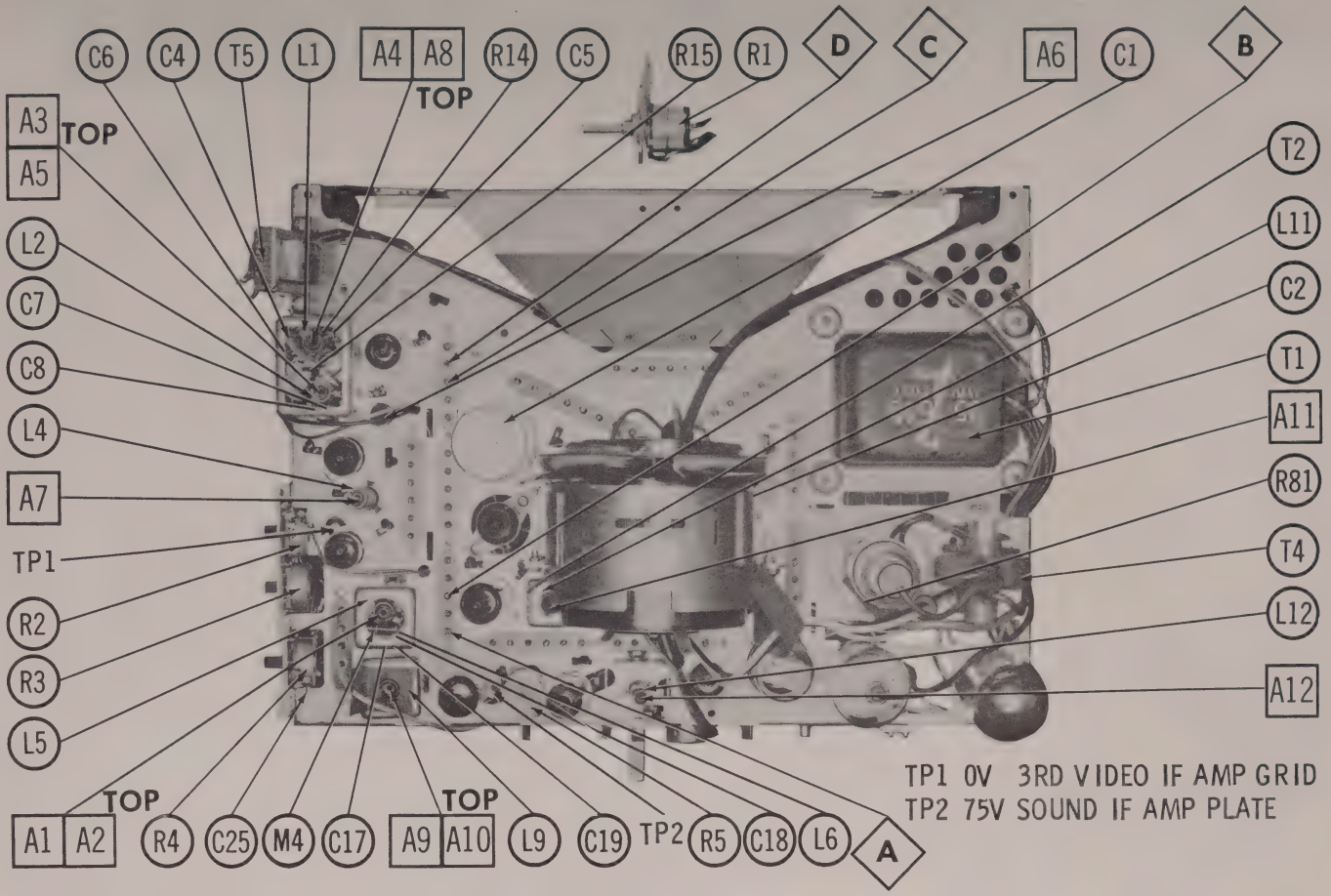
VHF TUNER with UHF Provisions 175-131, 175-149



CHASSIS - TOP VIEW

ZENITH MODELS E1416G, GU, E1801B, BU,
L, LU, E1803C, CU, L, LU (Ch. 16E20, U)

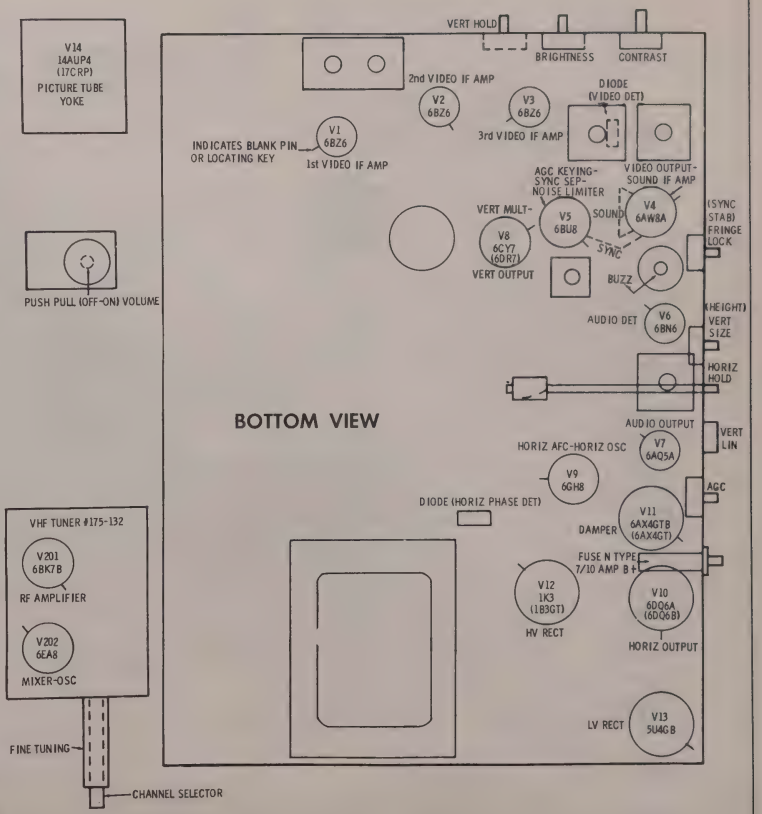
FOLDER 2

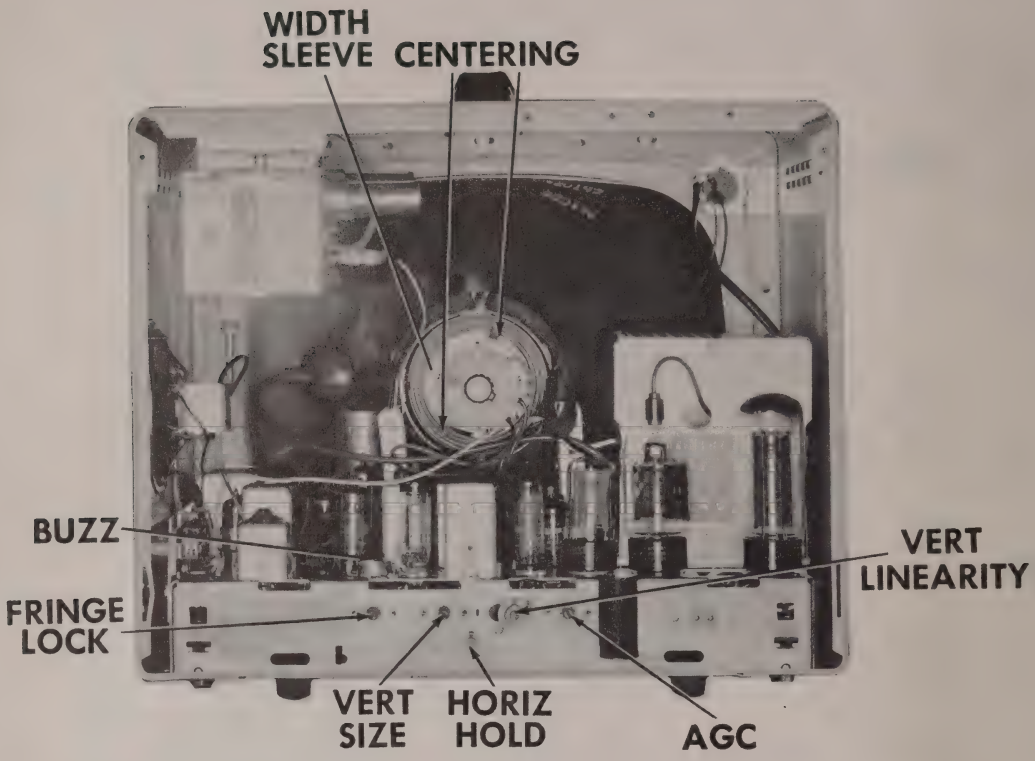
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.6meg	1560Ω	.1Ω	0Ω	▲240Ω	▲240Ω	1500Ω		
V2	6BZ6	50K	INF	.1Ω	0Ω	†280Ω	†280Ω	▲27Ω		
V3	6BZ6	.1Ω	120Ω	0Ω	.1Ω	†4700Ω	†4700Ω	0Ω		
V4	6AW8A	0Ω	100K	†32K	0Ω	.1Ω	47Ω	3000Ω	†33K	†10K
V5	6BU8	0Ω	†15K	960K	0Ω	.1Ω	● 1.1meg	†●650K	†40K	†8.3meg
V6	6BN6	●.445Ω	.4Ω	.1Ω	0Ω	†22K	3.7Ω	†390K		
V7	6AQ5A	0Ω	680Ω	.1Ω	0Ω	†1650Ω	†1000Ω	0Ω		
V8	6CY7	†520Ω	NC	2.2meg	0Ω	.1Ω	†●7meg	● 500K	0Ω	● 1600Ω
V9	6GH8	†68K	100K	†47K	0Ω	.1Ω	†120K	26Ω	0Ω	1.5meg
V10	6DQ6A	TP	.1Ω	TP	†15K	1meg	TP	0Ω	0Ω	TOP CAP †11Ω
V11	6AX4GTB	NC	NC	¶ INF	NC	†63Ω	NC	.1Ω	0Ω	
V12	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †245Ω
V13	5U4GB	NC	¶	TP	35Ω	NC	35Ω	NC	¶	
V14	14AUP4	0Ω	0Ω	Pin 6 0Ω	Pin 10 †330K	Pin 11 ● 180K	Pin 12 .1Ω			
V201	6BK7B	†1200Ω	200K	INF	0Ω	.1Ω	INF	3.7meg	0Ω	0Ω
V202	6EA8	†10K	100K	†68K	0Ω	.1Ω	†63Ω	0Ω	0Ω	10K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 3 OF V11.
† MEASURED FROM PIN 8 OF V13.
▲ MEASURED FROM PIN 2 of V2.
♦ MEASURED FROM PIN 3 OF V201.
NC NO CONNECTION
TP TIE POINT

TUBE PLACEMENT CHART





CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

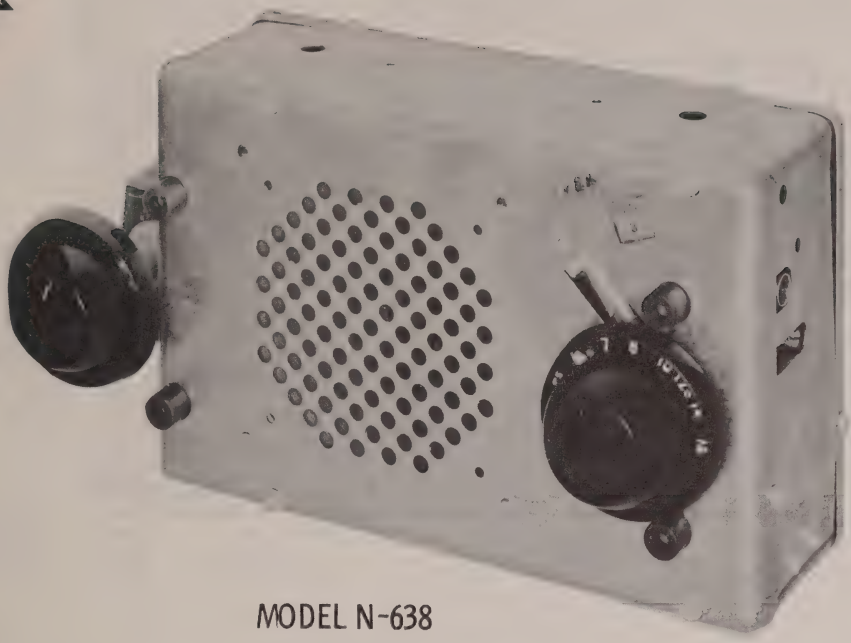
Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

PHOTOFACT® Folder

**AUTOMATIC MODELS
N-638, N-639, NA-749**

AUTOMATIC MODELS
N-638, N-639, NA-749



MODEL N-638

AUTOMATIC MODELS
N-638, N-639, NA-749

TRADE NAME	Automatic Models N-638, N-639, NA-749 (For 1958, 1959 Rambler American Automobiles)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube, 1 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538 — 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	High End Stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	High side thru 68mmf to antenna receptacle. Low side to chassis.	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400 KC and adjust A7 for maximum output.					

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JD804

SET493 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA TYPE
V1	RF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6
V3	IF Amplifier	12BL6 (12AF6) *
V4	Det.-AVC-AF Amp.	12J8

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	DT-41①	Output	DT-401	2N301		2N242	PNP

① Alternate Type #CT1122 or equivalent may be used.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	500	16	20-317	AFH3-00-95		WP200.6		TVLS-2157 *	①①
B	500	16							
C2	750	3	20-757	SRE3V500	BRI000-6	PETA190	TD-1000-6	TVAS-1097 *	

① In some versions, C1B is 150mfd (C1 Part #20-415).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800L						
C4	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	3000		DI-3000	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C7		#28-400						
C8	12 NPO			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C9	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C10		#28-281						
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	27		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C13	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C14	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

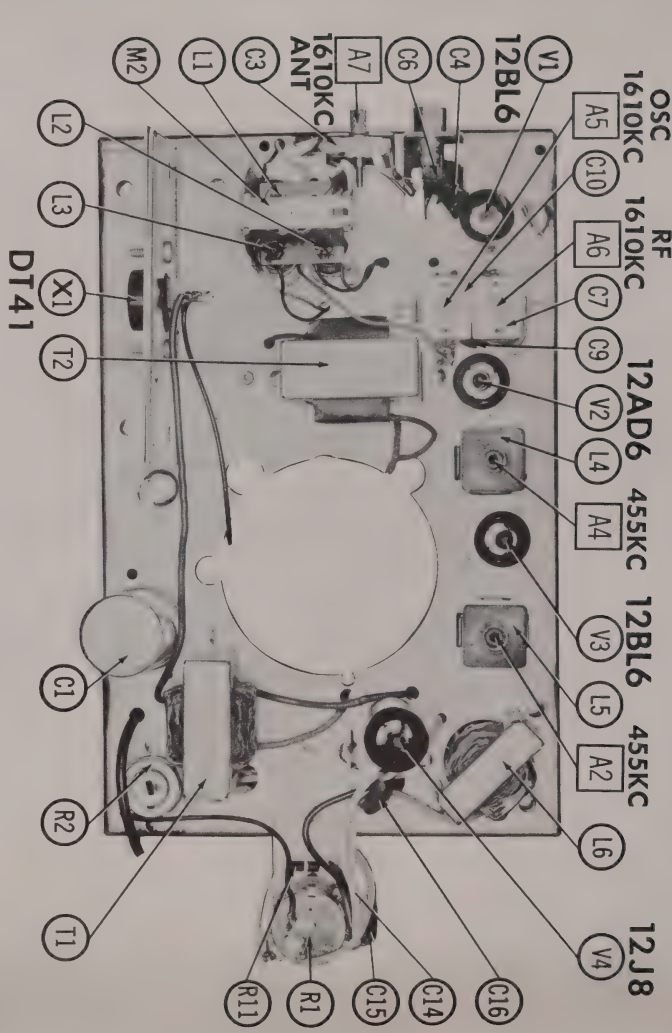
\# Automatic Part Number.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	80A953	F1-68				Tone
B	1meg 200K Tap	½		R2-59		† QJ-1263A		Volume
C	Bushing			AK-28				
D	Switch			KR-4				Power Off-On
R2	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias

† "Concentrikit" equivalent: K-8 Kit with base elements & shafts: B13-139, P17-129 (Panel); B13-137X, R1-216 (Rear); S15 (Bushing); 76-1 (Switch)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1.2meg	
R4	4.7meg	
R5	10meg	
R6	10meg	
R7	1500Ω	

ITEM No.	RATING	REMARKS
R8	150K	
R9	2.2meg	
R10	47K	
R11	100K	
R12	10meg	

ITEM No.	RATING	REMARKS
R13	1Ω	
R14	22Ω	
R15	68Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	†						† Part of M2
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	Input IF Trans.	14-1655-6	16-6758	16-6758	BC-352	12-C1	RF-1	
L5	Output IF Trans.	14-1655-6	16-6758	16-6758	BC-353	12-C2	RF-2	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	1.3A	.8Ω	.008 HY	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	15	1	75A602A						

TRANSFORMER (AUDIO OUTPUT)

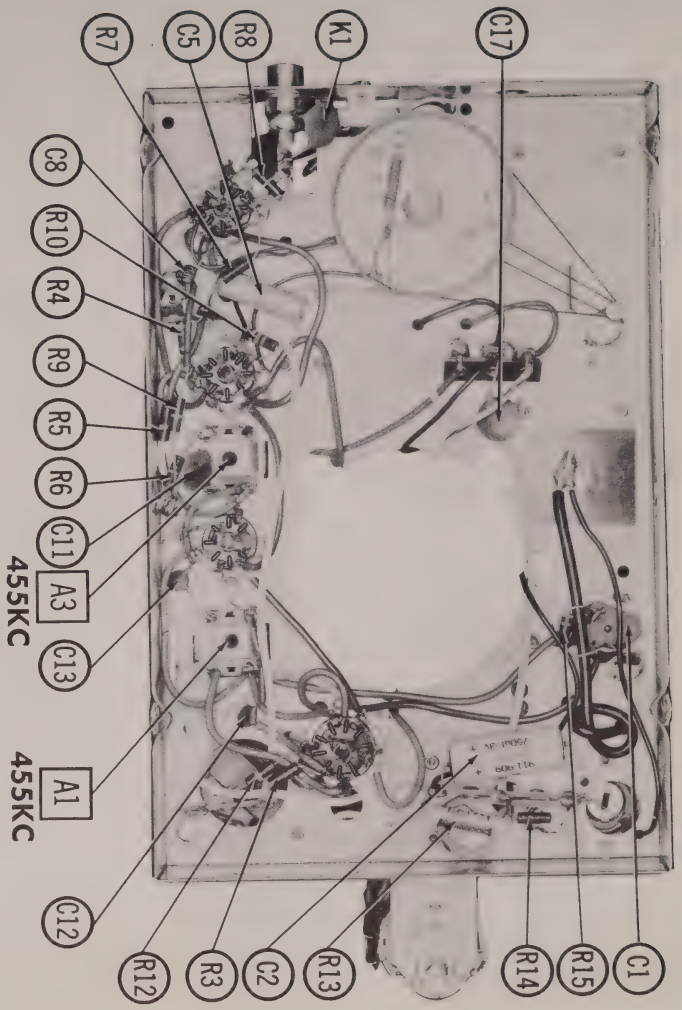
ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	20Ω	3-4Ω	75A603C①							

① Alternate Part #75A966.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	73A956	52A21SQ	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V	108-100		307007.5 (SFE 7½A 32V)	155009	SFE 7½	HHH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2	Tuner	78A948	

CABINETS & CABINET PARTS

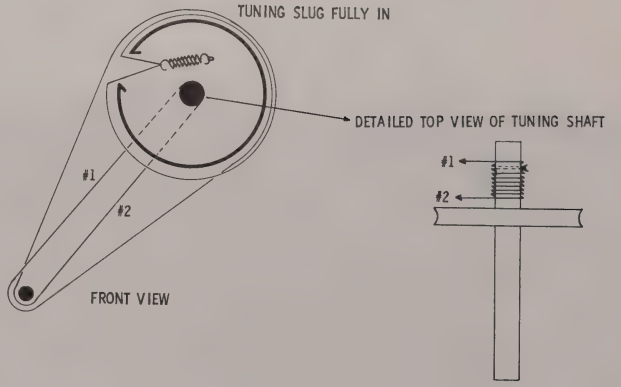
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

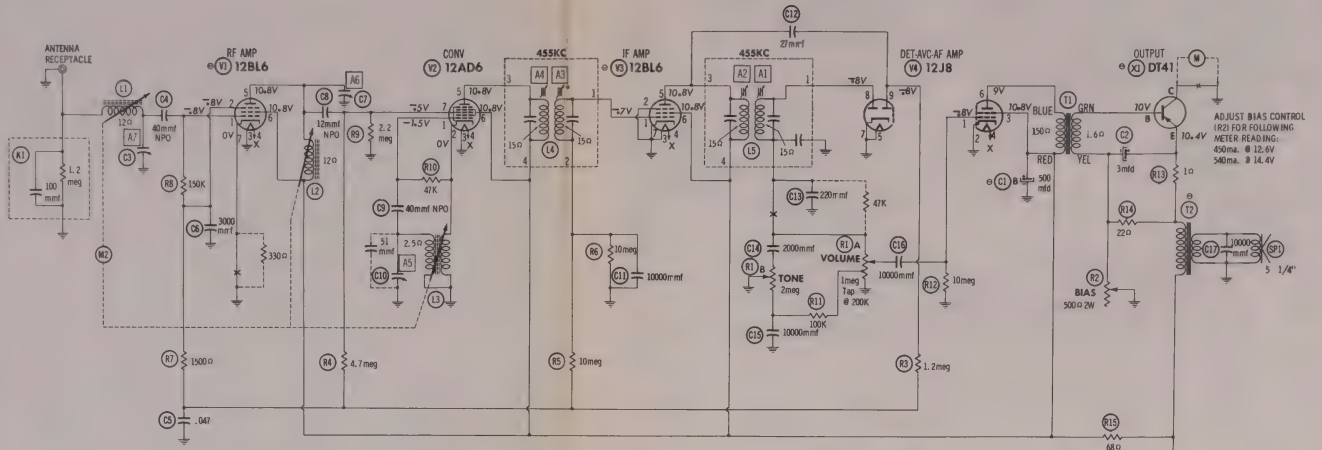
NAME	PART NO.	DESCRIPTION
Knob	47A947	Tuning, Volume
Knob	47A942	Tone
Pointer	84-A932	
Dial Scale	39-A945	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUNING DRIVE CORD STRINGING





1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

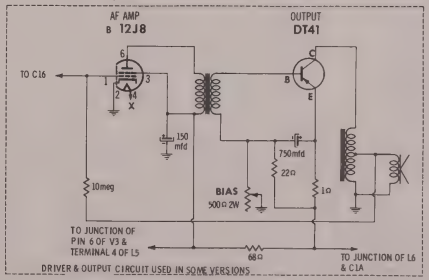
❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	5.5meg	5.4meg	0Ω	.8Ω	†80Ω	†68Ω	0Ω		
V2	12AD6	47K	.1Ω	0Ω	.8Ω	†80Ω	†68Ω	2.2meg		
V3	12BL6	6meg	0Ω	0Ω	.8Ω	†80Ω	†68Ω	0Ω		
V4	12J8	10meg	0Ω	†68Ω	.8Ω	0Ω	†220Ω	0Ω	1meg	6.5meg

† MEASURED TO JUNCTION OF R15 & C1A



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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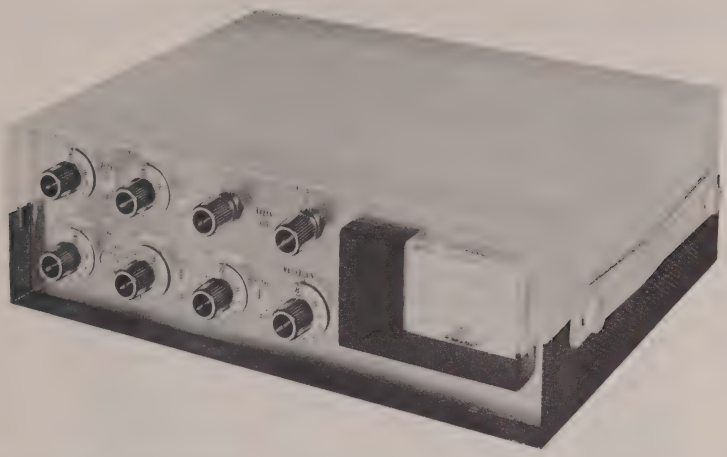
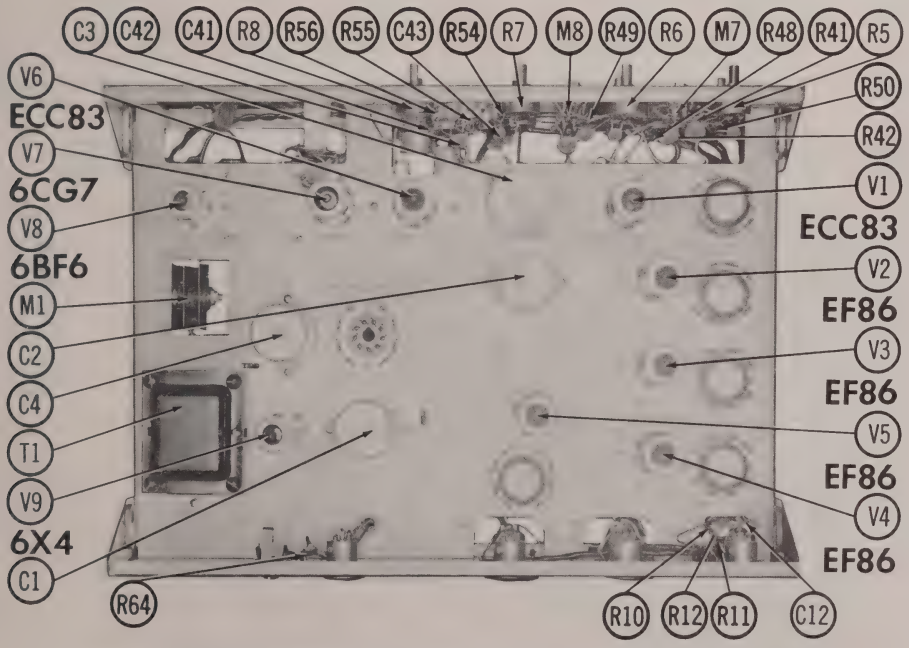
AUTOMATIC MODELS
N-638, N-639, NA-749

PHOTOFACT® Folder

BOGEN MODEL MXM



TRADE NAME	Bogen Model MXM
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 9 Tube, Multi-Input Audio Preamplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 36 Watts, .34 Amp. @117 Volts AC



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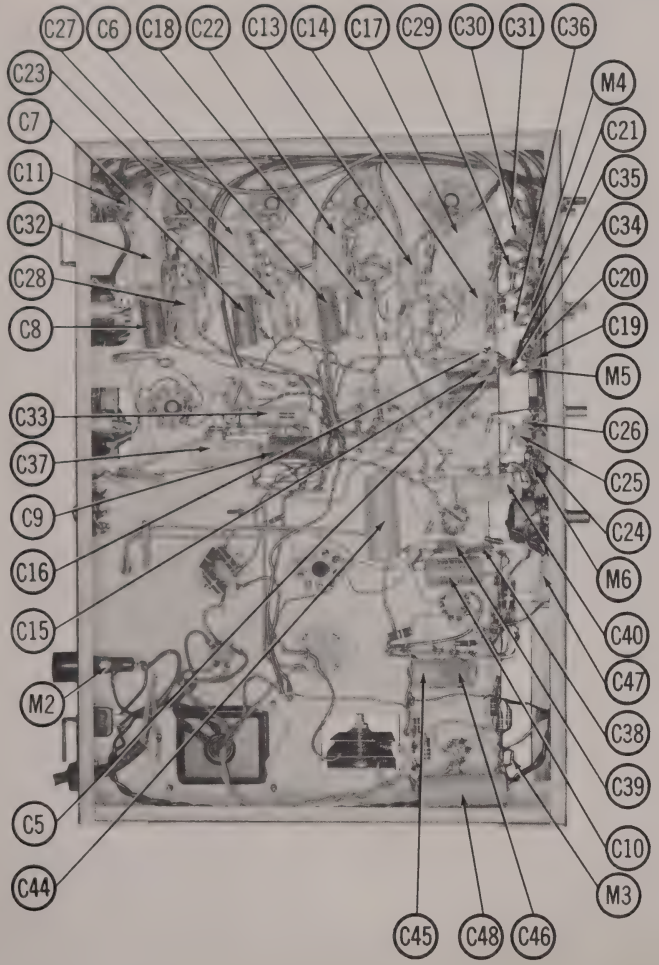
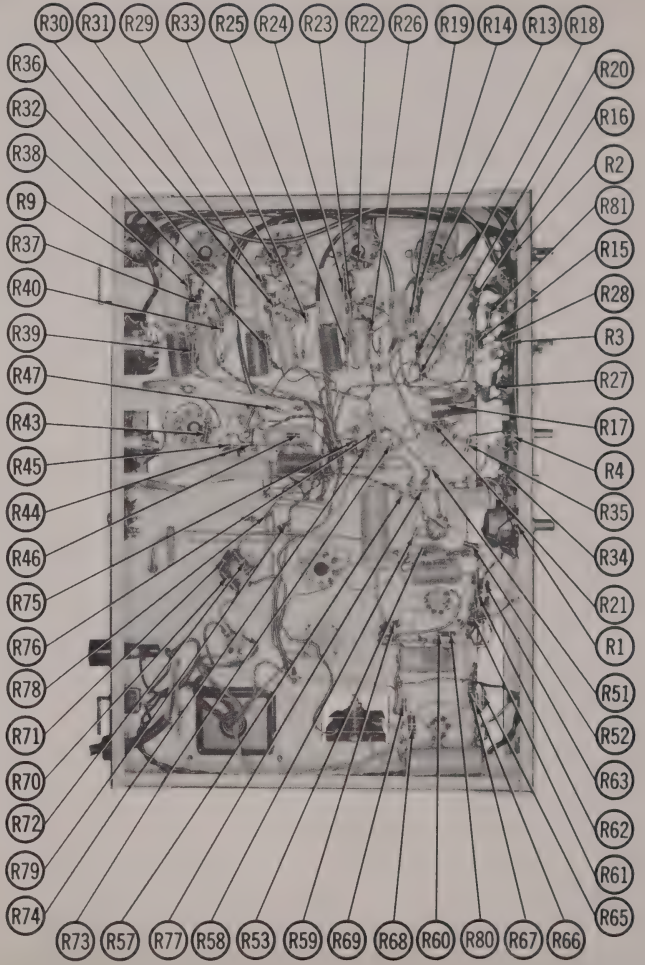
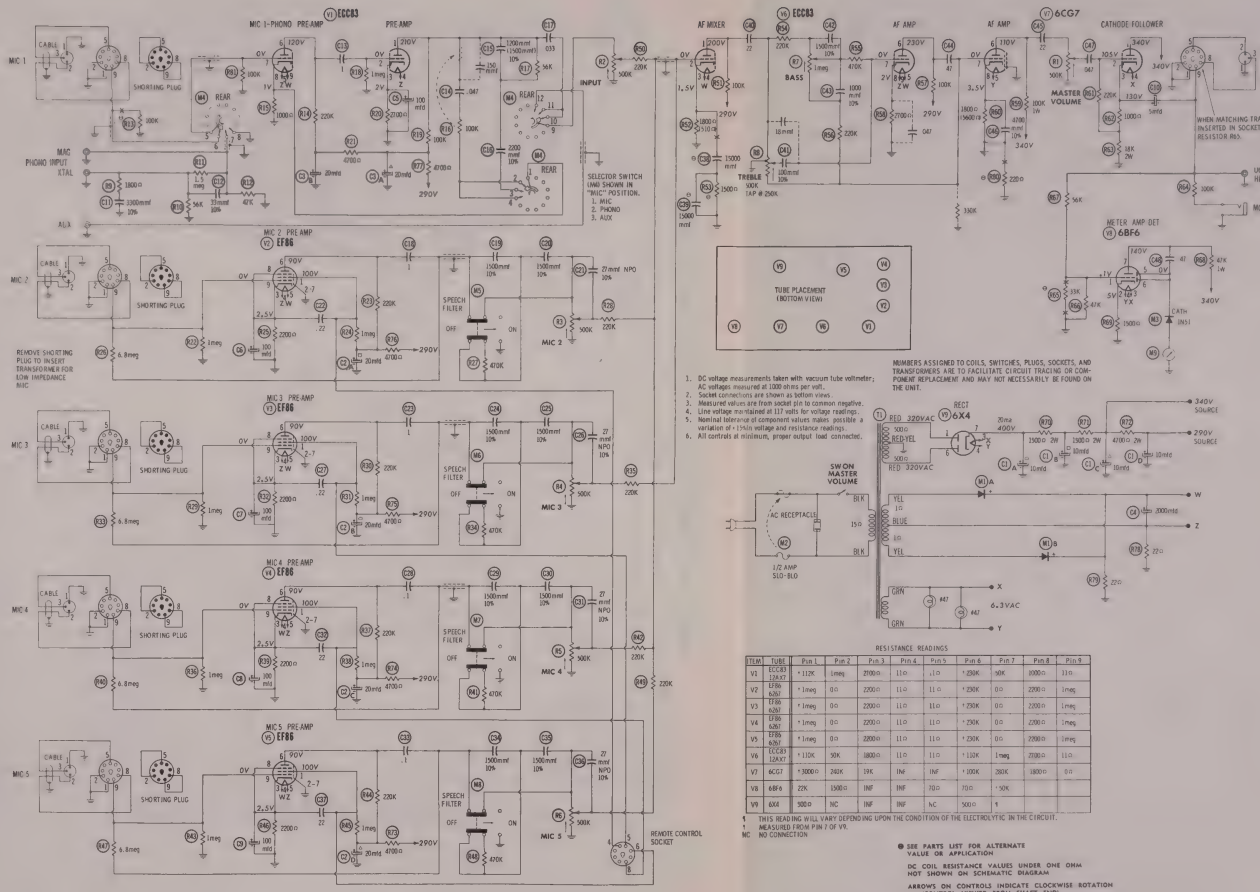
BOGEN MODEL MXM
BOGEN MODEL MXM
SET493 FOLDER 4



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR IDENT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	*.112K	1meg	2100Ω	11Ω	.1Ω	*.230K	50K	1000Ω	11Ω
V2	EF86 6267	*1meg	0Ω	2200Ω	11Ω	11Ω	*.230K	0Ω	2200Ω	1meg
V3	EF86 6267	*1meg	0Ω	2200Ω	11Ω	11Ω	*.230K	0Ω	2200Ω	1meg
V4	EF86 6267	*1meg	0Ω	2200Ω	11Ω	11Ω	*.230K	0Ω	2200Ω	1meg
V5	EF86 6267	*1meg	0Ω	2200Ω	11Ω	11Ω	*.230K	0Ω	2200Ω	1meg
V6	ECC83 12AX7	*.110K	50K	1800Ω	11Ω	11Ω	*.110K	1meg	2100Ω	11Ω
V7	6CG7	*3000Ω	240K	19K	INF	INF	*.100K	280K	1800Ω	0Ω
V8	6BF6	22K	1500Ω	INF	INF	70Ω	70Ω	*.50K		
V9	6X4	500Ω	NC	INF	INF	NC	500Ω	1		

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 7 OF V9.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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BOGEN MODEL MXM

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Mic 1- Phono Preamp.	ECC83/12AX7
V2	Mic 2 Preamp.	EF86/6267
V3	Mic 3 Preamp.	EF86/6267
V4	Mic 4 Preamp.	EF86/6267
V5	Mic 5 Preamp.	EF86/6267
V6	AF Mixer-AF Amp.	ECC83/12AX7
V7	AF Amp. -Cath. Follower	6CG7
V8	Meter Amplifier-Meter Detector	6BF6
V9	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART. No.	SPRAGUE PART No.	NOTES
C1A	▲10	450		AFH4-10	D0090	FP434	TMQ-10	TVL-4760	
B	■10	450							
C	▲10	450							
D	10	450							
C2A	■20	350		AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	▲20	350							
C	20	350							
D	▲20	350							
C3A	▲20	350		AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	20	350							
C	▲20	350	Note 1						
D	■20	350	Note 1						
C4	2000	15		AFH1-03	A0070	WP041	TMS-5	TVL-1168	
C5	100	6		PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	
C6	100	6		PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	
C7	100	6		PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	
C8	100	6		PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	
C9	100	6		PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	
C10	5	200		PRS1600	BBR4-250	TC50X	TD-4-250	TVA-1501	

Note 1. C3C and C3D are not used.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C12	33 10%		DI-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C13	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C14	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	1200 10%	(1500) †	DI-1200	DD-122	1R5D12	CCD-122	GP212	10TS-D12

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C16	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C17	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C19	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C20	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C21	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C22	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C23	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C24	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C25	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C26	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C27	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C28	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C29	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C30	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C31	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C32	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C33	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C34	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C35	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C36	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C37	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C38	15000	Note 1	BPD-015	DD-153	CUB6S15	CCD-153	B-115	5HK-S15
C39	15000	Note 1	BPD-015	DD-153	CUB6S15	CCD-153	B-115	5HK-S15
C40	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C41	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C42	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C43	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C44	.47 400V		P488N-47		CUB4P47	4DP-5-474	GEM-4047	4TM-P47
C45	.22 400V		P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22
C46	4700 10%		DI-4700		PM6D47	CCD-472	JL-247	10TS-D47
C47	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C48	.47 400V		P488N-47		CUB4P47	4DP-5-474	GEM-4047	4TM-P47

Note 1. Not used in some versions.
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	77-001-377	B-60-S	A47-500K-Z	Q13-133	U48	Master Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	500K	½	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R4A	500K	½	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	500K	½	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 5
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R7A	1meg	½	V376	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R8A	500K	½	V375	BT-65	A47F5-500K	Q19-133X	UF-431	Treble
	250K Tap							
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	1800Ω	
R10	56K	
R11	1.5meg	
R12	47K	
R13	100K	Note 1
R14	220K	
R15	1000Ω	
R16	100K	
R17	56K	
R18	1meg	
R19	100K	
R20	2700Ω	
R21	4700Ω	
R22	1meg	
R23	220K	
R24	1meg	
R25	2200Ω	
R26	6.8meg	
R27	470K	
R28	220K	
R29	1meg	
R30	220K	
R31	1meg	
R32	2200Ω	

ITEM No.	RATING	REMARKS
R33	6.8meg	
R34	470K	
R35	220K	
R36	1meg	
R37	220K	
R38	1meg	
R39	2200Ω	
R40	6.8meg	
R41	470K	
R42	220K	
R43	1meg	
R44	220K	
R45	1meg	
R46	2200Ω	
R47	6.8meg	
R48	470K	
R49	220K	
R50	220K	
R51	100K	
R52	1800Ω	(510Ω) *
R53	1500Ω	Note 1
R54	220K	
R55	470K	
R56	220K	

ITEM No.	RATING	REMARKS
R57	100K	
R58	2700Ω	
R59	100K 1W	
R60	1800Ω	(5600Ω) *
R61	220K	
R62	1000Ω	
R63	18K 2W	
R64	100K	
R65	33K	
R66	47K	
R67	56K	
R68	47K 1W	
R69	1500Ω	
R70	1500Ω 2W	
R71	1500Ω 2W	
R72	4700Ω 2W	
R73	4700Ω	
R74	4700Ω	
R75	4700Ω	
R76	4700Ω	
R77	4700Ω	
R78	22Ω	
R79	22Ω	
R80	220Ω	Note 1
R81	100K	

Note 1. Not used in some versions.
* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .34A	640 VCT @ .020A	6.3V @ 1.7A	83-501-010						
	SEC. 3	SEC. 4	SEC. 5							
	12.6 VCT @ 1.3A									

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	BOGEN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	1.3A	*			4N33-1C1-RV		* Bridge Type Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BOGEN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	¼A 125V S/B			313.500 (3AG ¼A 125V)	342001	MDL ¼	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		BOGEN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N51	1N51	1N51			Meter Detector

MISCELLANEOUS

ITEM No.	PART NAME	BOGEN PART No.	NOTES
M4	Switch	81-001-500	Selector (Rotary Type)
M5	Switch	81-003-010	Speech Filter (DPDT Slide Type)
M6	Switch	81-003-010	Speech Filter (DPDT Slide Type)
M7	Switch	81-003-010	Speech Filter (DPDT Slide Type)
M8	Switch	81-003-010	Speech Filter (DPDT Slide Type)
M9	VU Meter	94-1033-01	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**COLUMBIA
MODEL 909**

COLUMBIA
MODEL 909

COLUMBIA
MODEL 909

TRADE NAME	Columbia Model 909
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 28 Watts, .27 Amp @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR GLASER-STEERS GS-77 (REVISED) PHOTOFACT SET 482 FOLDER 11

SET 493 FOLDER 5

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT874

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel A AF Amp - Channel B AF Amp	12AX7
V2	Channel A Output	50C5
V3	Channel B Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	11B744		BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150			BBR20-150	TC45	TD-20-150	TVA-1410	
C	20	150							
D	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	270		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C5	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C6	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C7	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	270		DI-270	DD-271	L10T27	CCD-271	GP347	10TS-T27
C10	.5 200V		P288N-5		CUB2P5	2PD-5-504	GEM-205	2TM-P5
C11	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg		9B615					Loudness, Channel B
B	3meg							Loudness, Channel A
R2A	500K		9B614	B-60	AL47-500K-Z		FA55A	Treble, Channel B
B	500K			SR-60	Not Req.		RU55A	Treble, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	3meg		9B613	B-85			FC36A	Bass, Channel B
B	3meg			SR-85			RU36A	Bass, Channel A
C	Shaft			Not Req.			CS3500	

RESISTORS

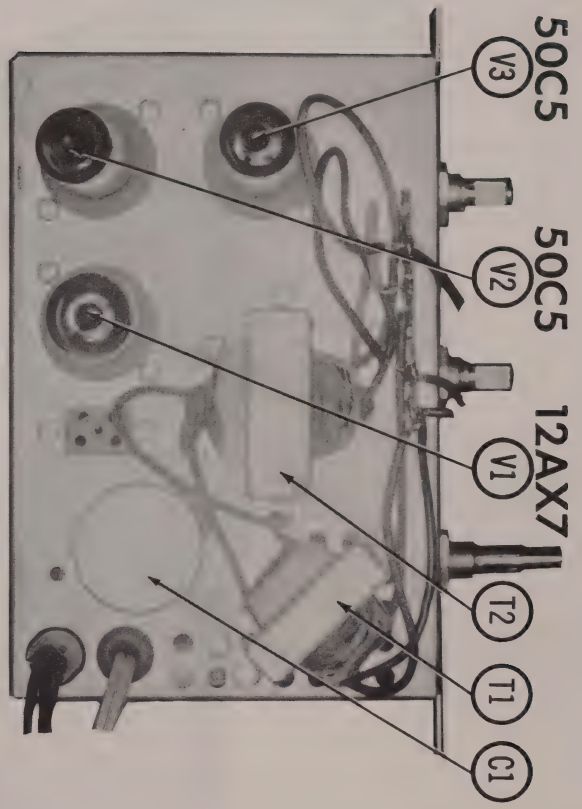
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	6.8meg	
R6	180Ω 1W	

ITEM No.	RATING	REMARKS
R7	100K	
R8	6.8meg	
R9	2200Ω	

ITEM No.	RATING	REMARKS
R10	100Ω 1W	
R11	47Ω 1W	
R12	47Ω 1W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	COLUMBIA PART No.	REPLACEMENT DATA
K1	Audio Coupling (Channel A)	10000mmf, 250mmf, 270K, 470K	5B304	Aerovox PA-112-4 Centralab PC-81 Cornell-Dubilier 113TM2 Sprague T-2
K2	Audio Coupling (Channel B)	10000mmf, 250mmf 270K, 470K	5B304	Aerovox PA-112-4 Centralab PC-81 Cornell-Dubilier 113TM2 Sprague T-2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5000Ω CT	6-8Ω CT	3B237							
T2	1350Ω	1-2Ω	3B238							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	1B108	6A21	
SP2	4"	PM	3-4Ω	1B125	3A07	
SP3	6"	PM	3-4Ω	1B108	6A21	
SP4	4"	PM	3-4Ω	1B125	3A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.055A	10B615 *	2E4 *	HA154 *	K200 *	SR200 *	* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	COLUMBIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	CD-1			26ST	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

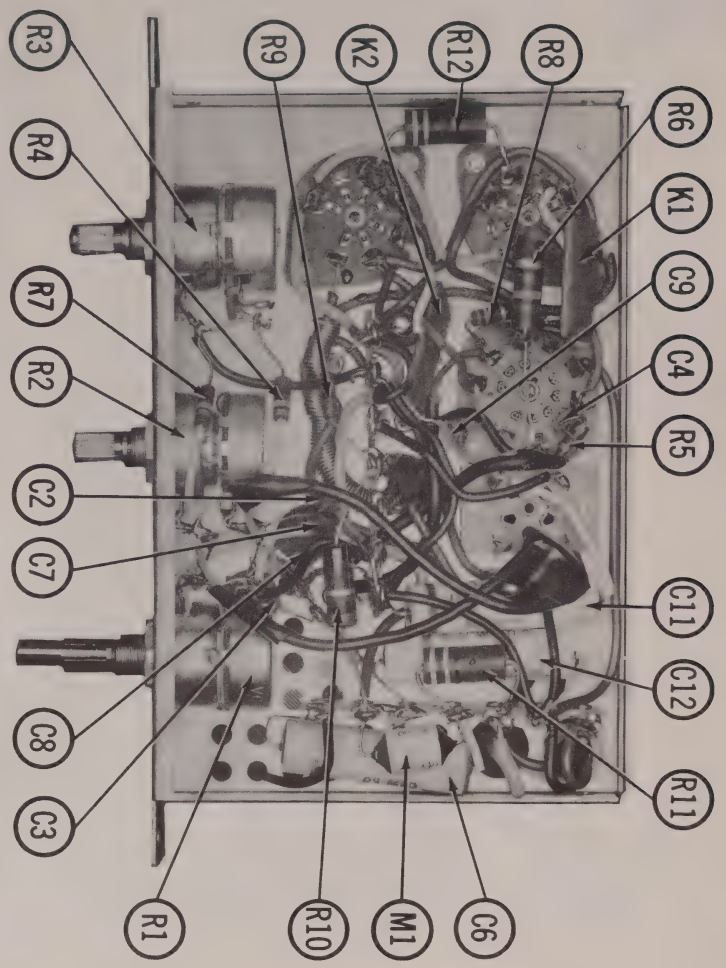
ITEM No.	REPLACEMENT DATA			REMARKS
	COLUMBIA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(Part of M2)	W-110STS † or W-110STD ♦	CS-1X † or CS-1XD ♦	† Jewel ♦ Diamond

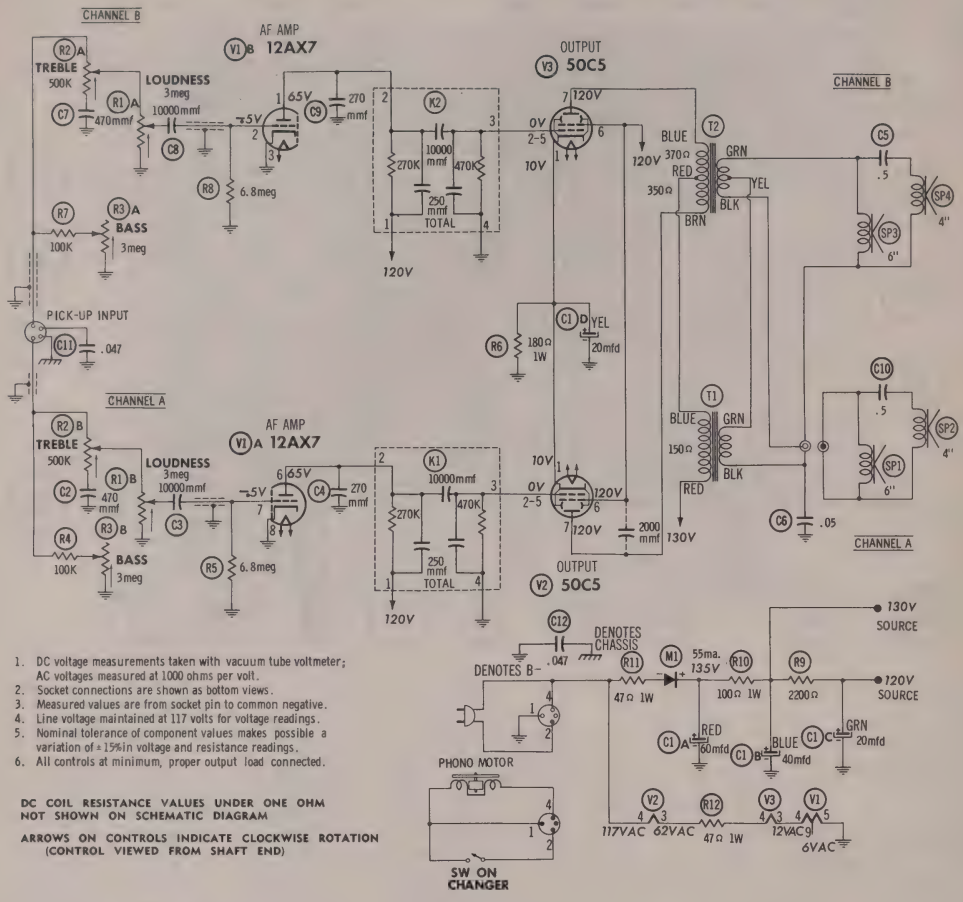
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B501	Black, chrome insert 1/4" Extension
Knob	8B502	Black, chrome insert
Knob	8B503	Clear
Cabinet	17B828	

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	6.8meg	0Ω	12Ω	0Ω	†270K	6.8meg	0Ω	6Ω
V2	50C5	180Ω	470K	110Ω	160Ω	470K	†2300Ω	†620Ω		
V3	50C5	180Ω	470K	12Ω	62Ω	470K	†2300Ω	†600Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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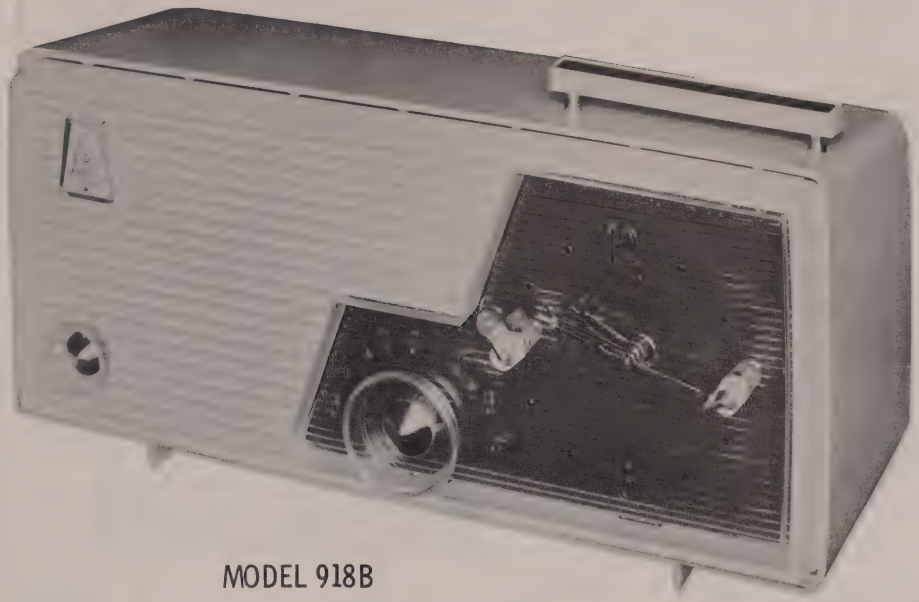
COLUMBIA MODEL 909

PHOTOFACT® Folder with CIRCUITRACE®

EMERSON MODELS 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B)

EMERSON MODELS 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B)



MODEL 918B

EMERSON MODELS 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B)

TRADE NAME	Emerson Models 876B (Ch. 120479B), 881B (Ch. 120474B), 883B (Ch. 120475B), 915B, 924B (Ch. 120487B) 916B, 917B, 918B (Ch. 120484B)
MANUFACTURER	Emerson Radio & Phono Corp., 524 W. 23rd Street, New York 11, N. Y.
TYPE SET	AC Operated 5 Tube AM Receiver. All Models are Clock Versions except Models 876B, 915B, 924B
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 26 Watts, .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools
A1 thru A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .005mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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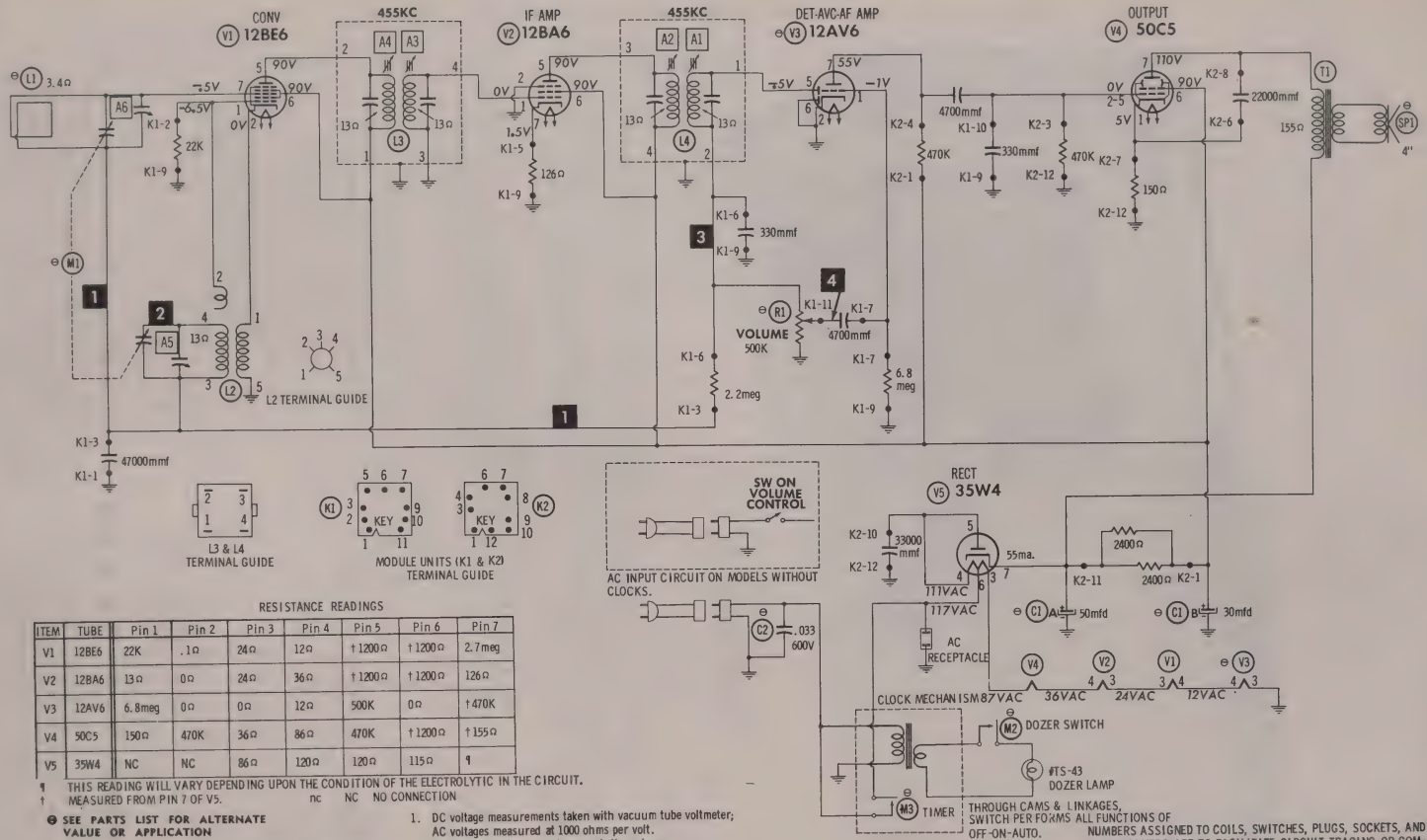
JG953

SET 493 FOLDER 6



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.1Ω	24Ω	12Ω	†1200Ω	†1200Ω	2.7meg
V2	12BA6	13Ω	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	126Ω
V3	12AV6	6.8meg	0Ω	0Ω	12Ω	500K	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1200Ω	†155Ω
V5	35W4	NC	NC	86Ω	120Ω	120Ω	115Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. nc NC NO CONNECTION

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

EMERSON MODELS 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B)

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with CIRCUITRACE®

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	
V1	Converter	12BE6	V4	Output	50C5	
V2	IF Amplifier	12BA6	V5	Rectifier	35W4	
V3	Det. -AVC-AF Amp.	12AV6 (12AT6) *				

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	925402 ①	PR2-030	ESS7515	PWD211	TDLD-8	TVA-2450	
B	30	150							

① Alternate Part #925372

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.033 600V	Note 1	P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33

Note 1. Not used in Chassis 120487B.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	500K	1/2	390610 ①					Volume.

① Chassis 120474B and 120475B use Part #390495.
Chassis 120479B uses Part #390451 (includes On-Off Switch).
Chassis 120487B uses Part #390605 (includes On-Off Switch).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No.	REPLACEMENT DATA
K1	RF-IF Circuit	(2) 330mmf, 4700mmf, 47000mmf, 126Ω, 22K, 2.2meg, 6.8meg	750140	
K2	Audio Circuit	4700mmf, 22000mmf, 33000mmf, 150Ω, (2) 2400Ω, (2) 470K	750141	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		EMERSON PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	700131 ①						
L2	Osc. Coil	716119						
L3	Input IF Trans.	720259-1	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF Trans.	720259-2	16-6780	16-6780	BC-357	13-PC2	RF-4	

① Part #700118 used in Chassis 120487B.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω	3-4Ω	734193	24S53 ①	A-3025①	AU-605①	A-3332①	24S53 ①	S-12X①	

① Use Original Frame.

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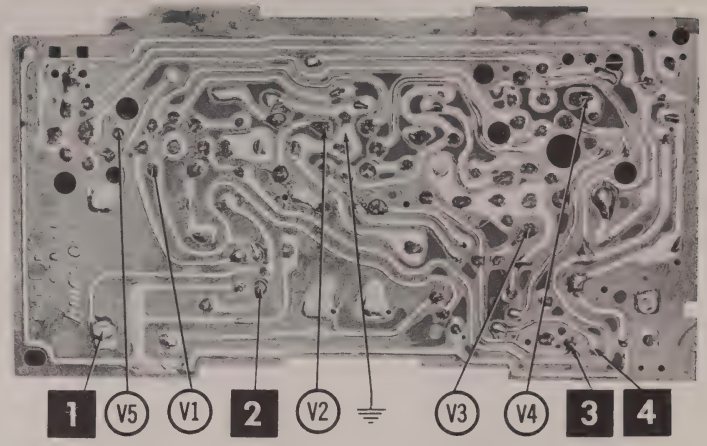
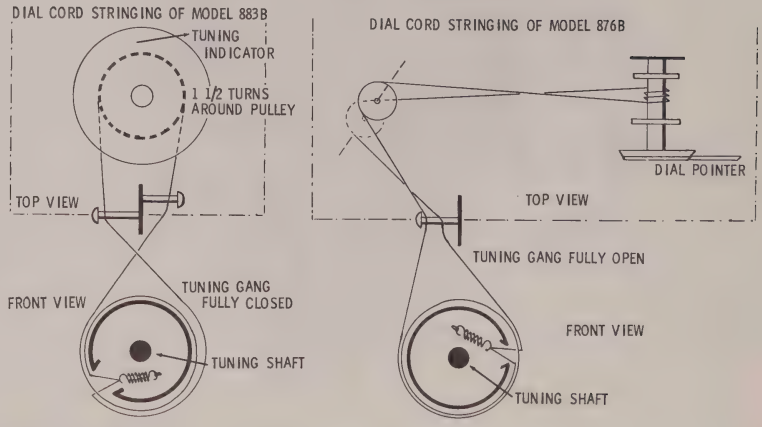
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



DIAL CORD STRINGING



EMERSON MODELS 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B)

FOLDER 6

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	180176 ①	4A07	① All Models except 915, 924
	4"	PM	3-4Ω	180149 ②	4A07	② Models 915, 924

MISCELLANEOUS

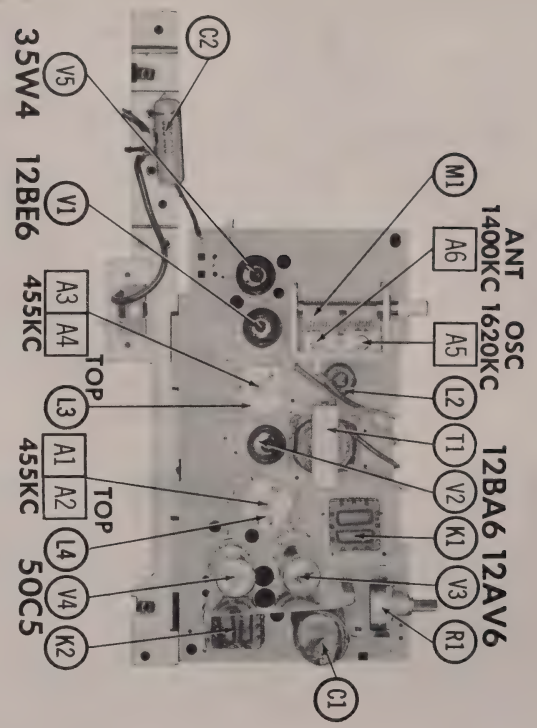
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M1	Tuning Cap	900198	2 Gang, Chassis 120484B
	Tuning Cap	900176	2 Gang, Chassis 120479B
	Tuning Cap	900195	2 Gang, Chassis 120487B
	Tuning Cap	900173 (or)	2 Gang, Chassis 120474B, 120475B
	Tuning Cap	900174	
M2	Switch	510129	Dozer, Models 883B & 918B only
M3	Timer	471195	Model 918B
	Timer	471192	Model 917B
	Timer	471191	Model 916B
	Timer	471030	Model 883B
	Timer	471019	Model 881B

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461175	Tuning, Models 915B, 924B
Knob	460926	Tuning, Model 881B
Knob	461182	Tuning, Models 916B, 917B & 918B
Knob	460770L	Tuning, & Volume, Models 876B, 883B
Knob	461176	Volume, Models 915B, 924B
Knob	460770L	Volume, Model 881B
Knob	461181	Volume, Models 916B, 917B, 918B
Knob	460509B	Timer, Model 881B
Knob	461173	Timer, Model 916B
Knob	461174	Timer, Models 917B, 918B
Knob	460625	Timer, Model 883B
Dial Pointer	525068A	Model 876B
Clock Dial	520260	Model 881B
Clock & Radio Dial	413546	Model 916B
Clock & Radio Dial	413583	Model 917B
Clock & Radio Dial	413663	Model 918B
Dial Crystal	520252	Model 881B
Dial Crystal	460902	Model 883B
Dial Crystal	461177	Model 916B
Dial Crystal	461170	Models 917B, 918B
Dial Crystal	460967	Model 876B
Cabinet	141044	Pink, Model 915B
Cabinet	141058A	Pink, Model 924B
Cabinet	140877	Pink, Model 881B
Cabinet	140879	Pink, Models 883B, 918B
Cabinet	140856	Pink, Models 916B, 917B, 876B
Cabinet	141044A	White, Model 915B
Cabinet	141058B	White, Model 924B
Cabinet	141044B	Turquoise, Model 915B
Cabinet	141058C	Turquoise, Model 924B
Cabinet	140877B	Turquoise, Model 881B
Cabinet	140879B	Turquoise, Models 883B, 918B
Cabinet	140856B	Turquoise, Models 916B, 917B, 876B
Cabinet	141044C	Ivory, Model 915B
Cabinet	141058	Ivory, Model 924B
Cabinet	140877C	Ivory, Model 881B
Cabinet	140879C	Ivory, Model 883B
Cabinet	140856C	Ivory, Model 876B
Cabinet	140856E	Ivory, Models 916B, 917B
Cabinet	140879E	Ivory, Model 918B
Cabinet	141044D	Ebony, Model 915B
Cabinet	141058D	Ebony, Model 924B
Cabinet	140877D	Ebony, Model 881B
Cabinet	140856D	Ebony, Models 916B, 917B, 876B

CHASSIS—TOP VIEW



CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Cabinet	140879D	Ebony, Models 918B, 883B
Cabinet	140856A	Green, Model 876B
Cabinet	140877A	Green, Model 881B
Cabinet	140879A	Green, Models 883B, 918B
Cabinet	140856A	Green, Models 916B, 917B

WIRING DATA

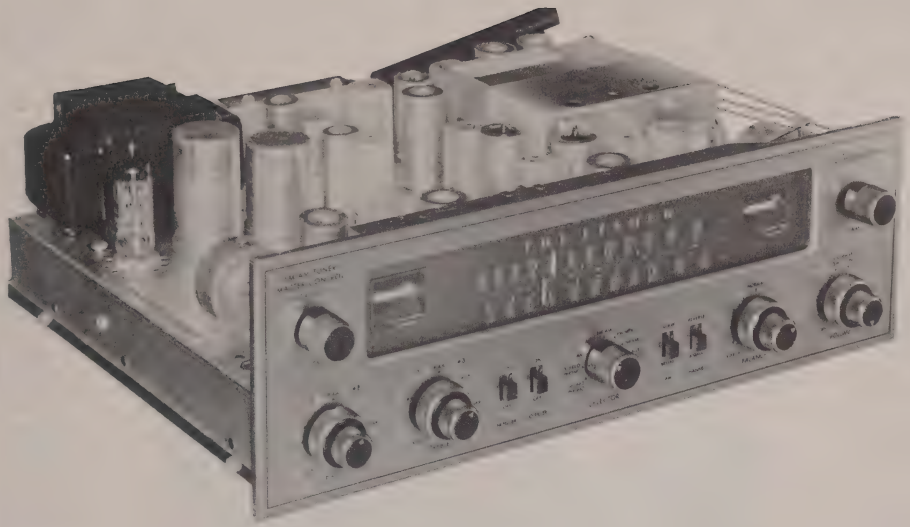
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

PHOTOFACT® Folder

FISHER MODEL 100-T

FISHER MODEL 100-T



FISHER MODEL 100-T

TRADE NAME	Fisher Model 100-T (Serial #30001-39999 Inclusive)		
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.		
TYPE SET	AC Operated 16 Tube FM-AM Receiver		
POWER SUPPLY	105 - 120 Volts AC, 50-60 Cycles	RATING	72 Watts, .67 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 - 1620KC	FREQ. MOD.	88 – 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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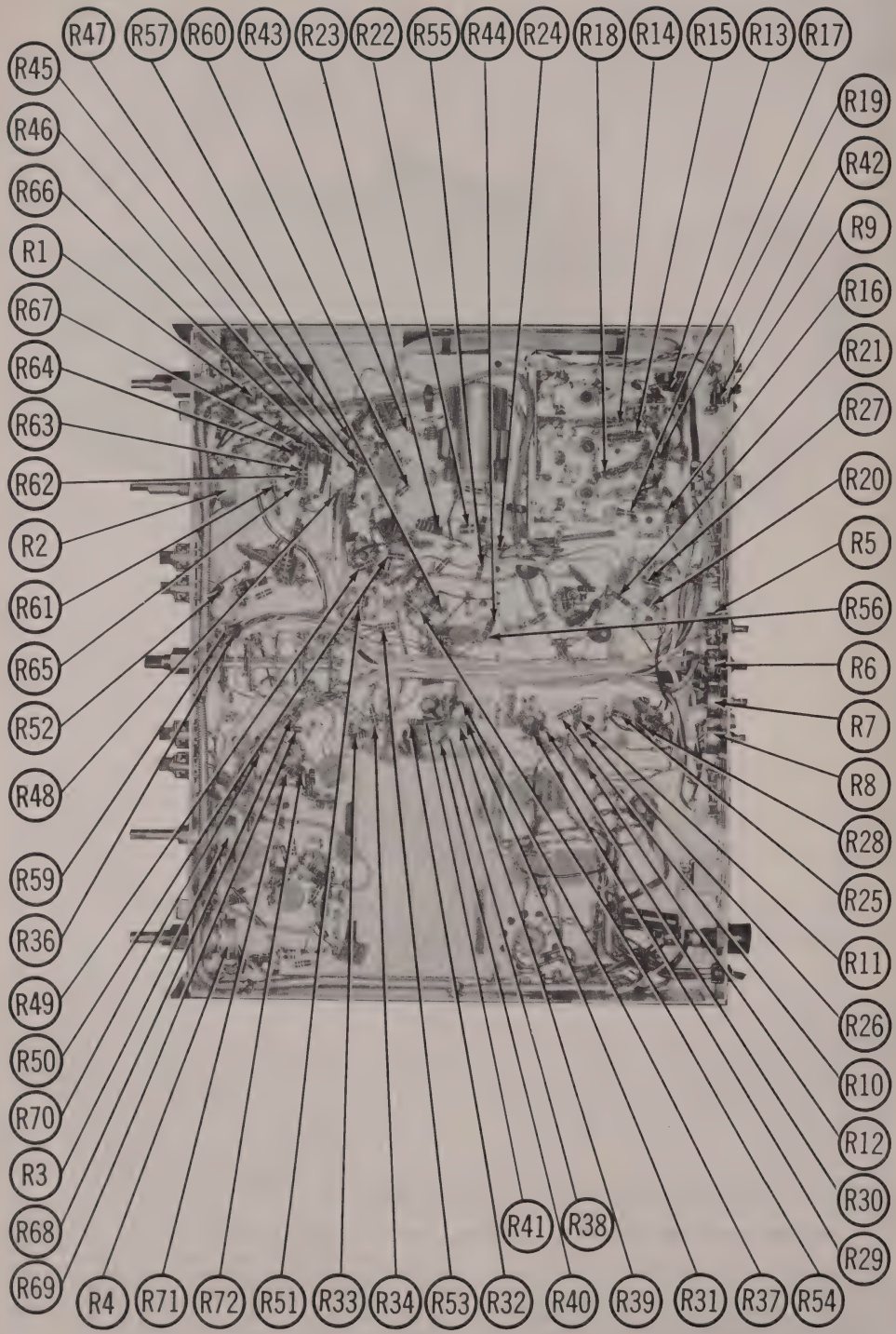
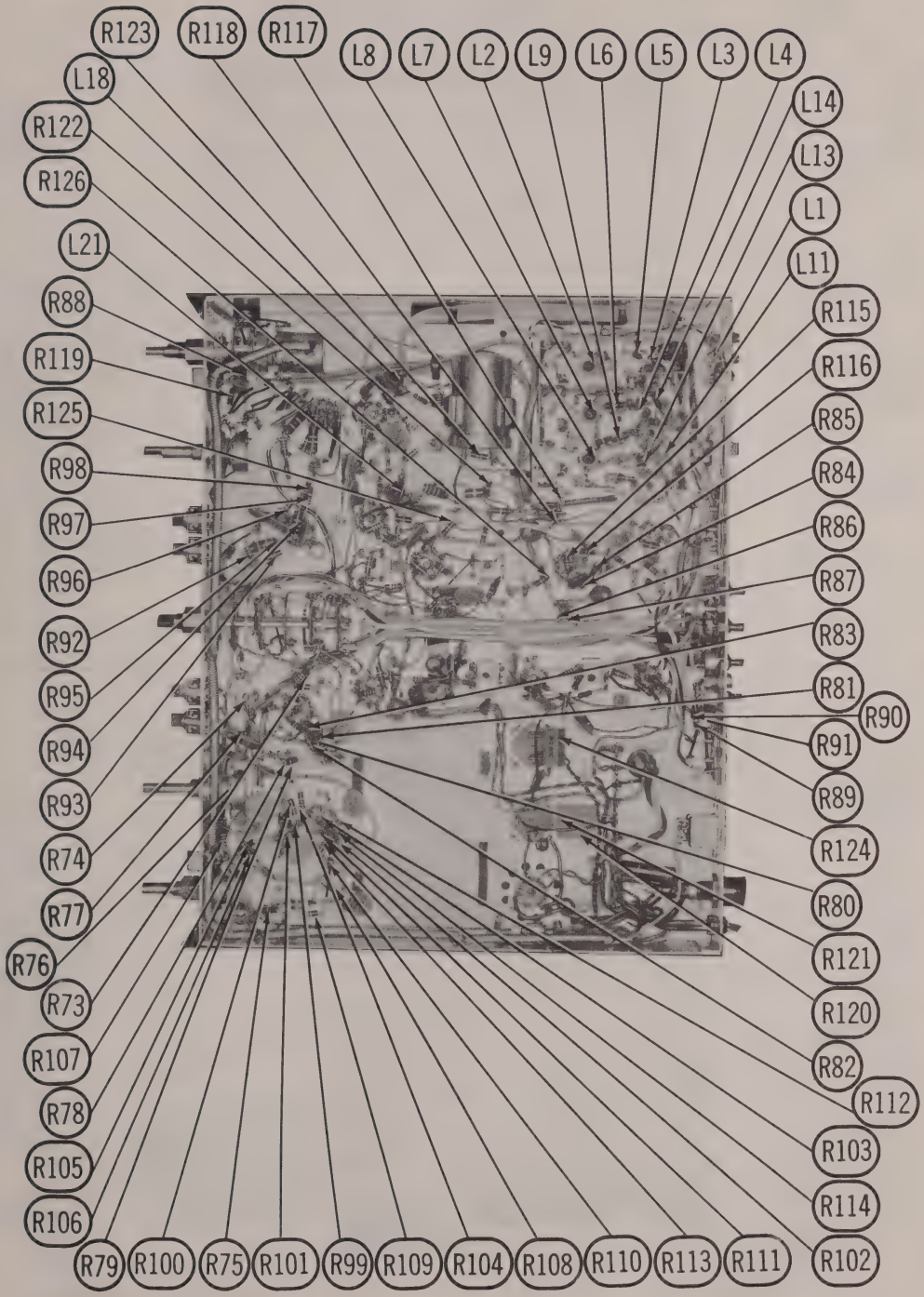
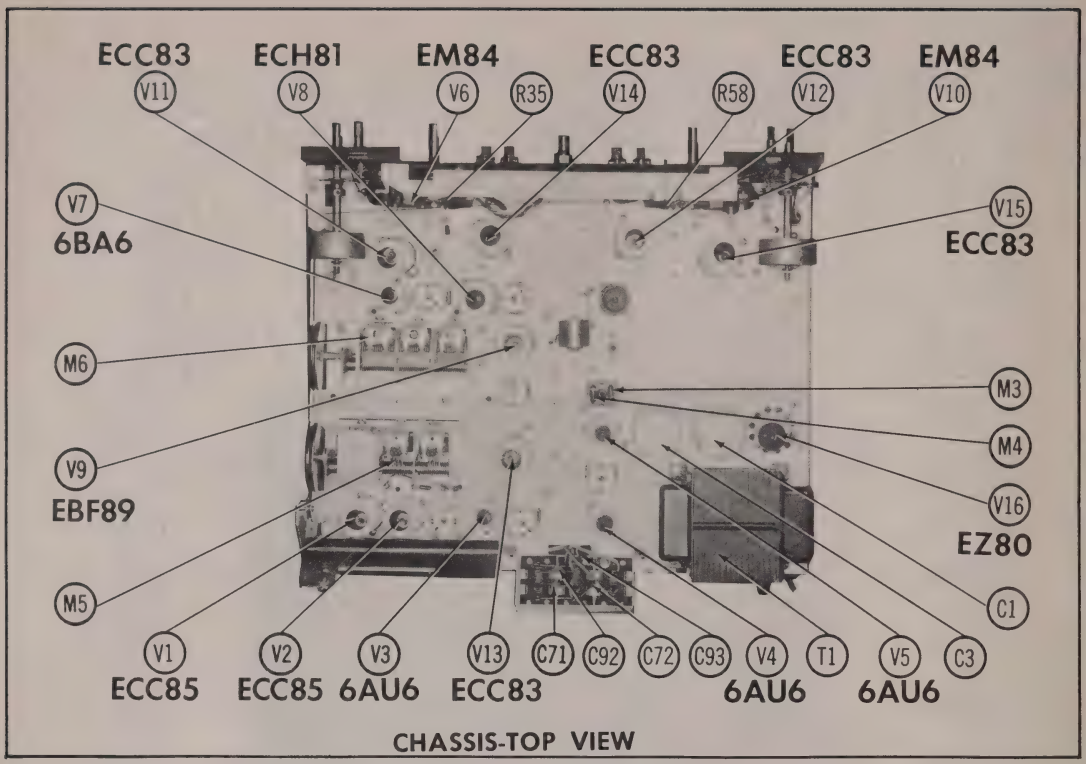


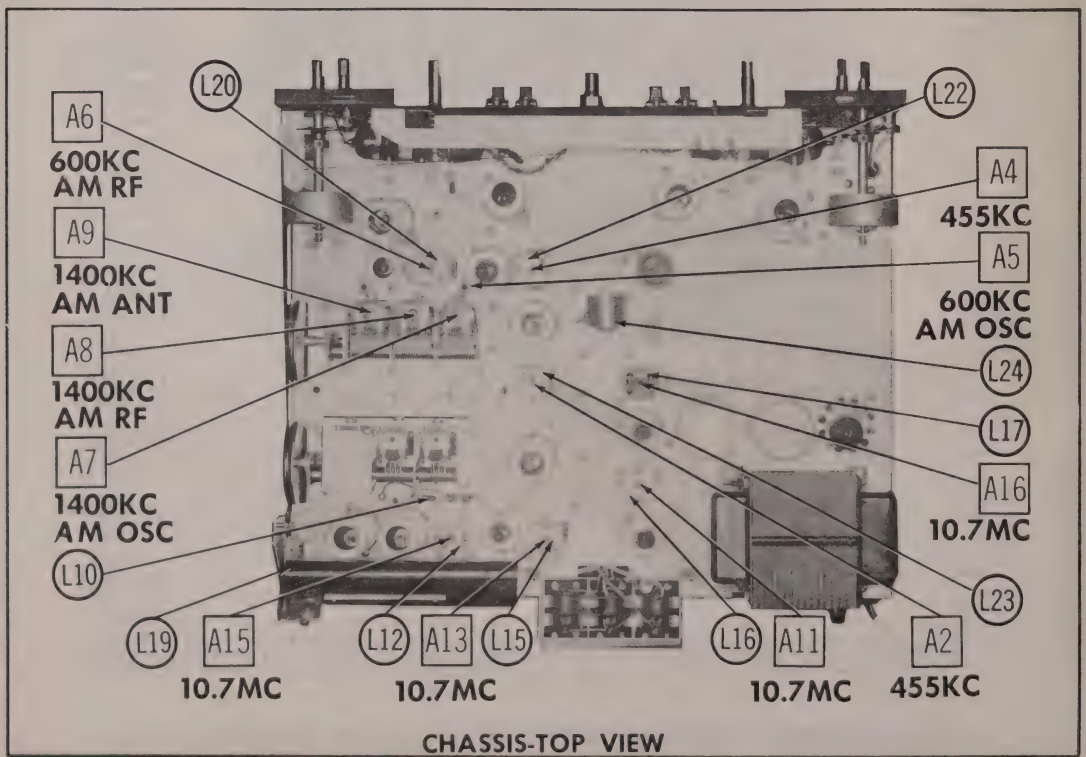
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS-TOP VIEW



CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Use only enough sweep generator output to provide a usable pattern on scope.

Suggested alignment tools:

A1 thru A4, A6, A11 thru A15...	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A10, A16, A17, A18, A19.....	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A7, A8, A9.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A20, A21, A22.....	GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089 WALSCO #2512, 2525, 2528

AM ALIGNMENT — SELECTOR IN AM POSITION

AM Bandwidth switch in "SHARP" Position.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	455KC (400∿ 30% AM Mod.	(AM) Point of non-interference.	DC probe to point A . Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
	Set bandwidth switch to "Broad". Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Disconnect after Step 2 and return switch to 'Sharp".					
2.	High side thru .01mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	455KC (30KC Swp)	(AM) Point of non-interference.	USE SCOPE . Vert. Amp. to point (A) . Common to chassis.	A4	Retouch A4 for symmetrical curve. Return Bandwidth to SHARP.
3.	High side thru 220mmf to AM antenna terminal #3. Low side to chassis. Disconnect link between terminals 1 and 2.	600KC (400∿ 30% AM Mod.)	600KC	DC probe to point (A) . Common to chassis.	A5, A6	Adjust for maximum deflection.
4.	"	1400KC	1400KC	"	A7, A8, A9	Adjust for maximum deflection. Repeat Steps 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side to ungrounded tube shield floating over FM Mixer-Oscillator tube. Low side to chassis.	10.7MC (Unmod.)	FM Point of non-interference.	DC probe to point (B) . Common to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum deflection.
6.	"	"	"	DC probe to point (C) . Common to chassis.	A16	Adjust for zero reading. A positive and negatuve reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

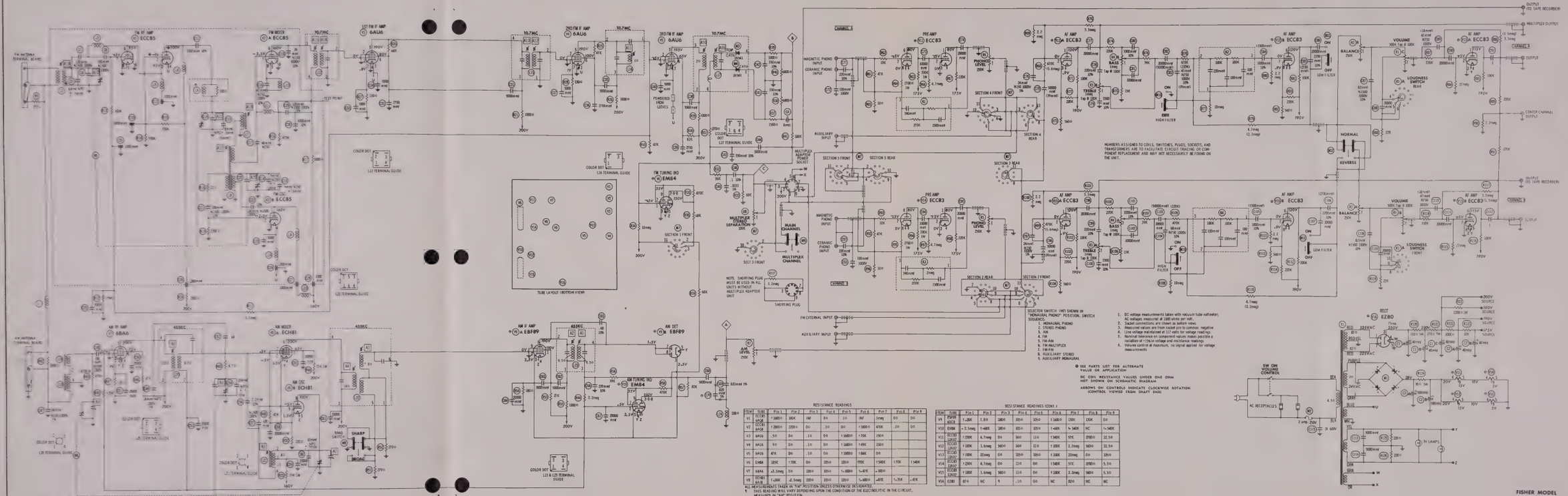
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side to ungrounded tube shield floating over FM Mixer-Oscillator tube. Low side to chassis.	10.7MC	FM Point of non-interference.	Vert. amp. to point (B) . Low side to chassis.	A10, A11, A12, A13, A14, A15	Disconnect Stabilizing capacitor C4. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C4.
6.	"	"	"	Vert. amp. to point (C) . Low side to chassis.	A16	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM Antenna terminals with 120Ω in each lead.	90MC (Unmod.)	FM 90MC	DC probe to point (B) . Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
8.	"	106MC	106MC	"	A20, A21, A22	Adjust for maximum deflection. Repeat Steps 7 and 8.

REFER TO PAGE 10 FOR ALIGMENT FIGURES.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of +/-5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

SELECTOR SWITCH (MD) SHOWN IN "MONAURAL PHONO" POSITION. SWITCH SEQUENCE:
1. MONAURAL PHONO
2. STEREO PHONO
3. AM
4. FM
5. FM-AM
6. FM MULTIPLEX
7. FM-FM
8. AUXILIARY STEREO
9. AUXILIARY MONAURAL

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

COLOR DOT L22 TERMINAL GUIDE

COLOR DOT L23 TERMINAL GUIDE

COLOR DOT L1 & L23 TERMINAL GUIDE

COLOR DOT L2 TERMINAL GUIDE

COLOR DOT L3 TERMINAL GUIDE

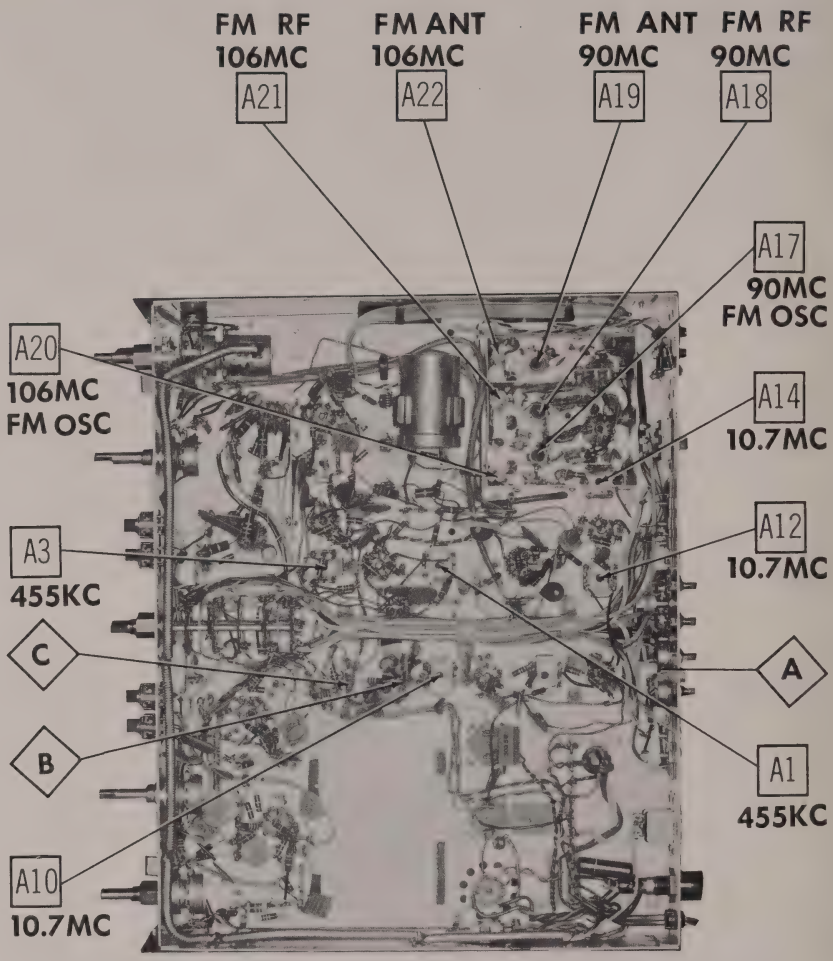
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†.1MEG	180K	INF	0Ω	1.0	INF	1meg	0Ω	0Ω
V2	ECC85 6AQ8	†.2MEG	220KΩ	0Ω	30	0Ω	†.1MEG	470K	.2Ω	0Ω
V3	6AU6	5Ω	0Ω	.1Ω	0Ω	†.1MEG	†70K	150Ω		
V4	6AU6	9Ω	0Ω	.1Ω	0Ω	†.1MEG	†49K	150Ω		
V5	6AU6	47K	0Ω	.1Ω	0Ω	†.1MEG	†84K	0Ω		
V6	EM84	185K	†70K	0Ω	185Ω	185Ω	†90K	†540K	†70K	†540K
V7	6BA6	+3.5meg	0Ω	125Ω	305Ω	†.1MEG	†.47K	+.1MEG		
V8	ECH81 6AJ8	†.24K	-2.5meg	225Ω	325Ω	125Ω	†.68MEG	+.47K	†.35K	+.47K

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
§ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V1A.
NC NO CONNECTION

RESISTANCE READINGS (CONT.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	PCF80 6DC8	†.28K	2.8Ω	28Ω	10Ω	25Ω	†.1MEG	1MEG	150K	0Ω
V10	EM84	+.2.5meg	†.48K	28Ω	10Ω	25Ω	†.48K	†.540K	NC	†.540K
V11	ECC82 12AU7	†.28K	6.7meg	0Ω	16Ω	11Ω	†.1MEG	51K	270Ω	12.5Ω
V12	ECC82 12AU7	†.28K	6.7meg	56Ω	16Ω	11Ω	†.28K	6.2meg	560Ω	12.5Ω
V13	ECC82 12AU7	†.28K	22meg	0Ω	125Ω	105Ω	†.28K	22meg	0Ω	105Ω
V14	ECC82 12AU7	†.25K	6.7meg	0Ω	11Ω	0Ω	†.54K	51K	270Ω	5.5Ω
V15	ECC88 12AX7	†.28K	1.6meg	56Ω	11Ω	0Ω	†.28K	2.2meg	560Ω	5.5Ω
V16	EZ80	87Ω	NC	9	.1Ω	0Ω	NC	82Ω	NC	NC



CHASSIS BOTTOM VIEW-ALIGNMENT IDENTIFICATION

FIG. 1

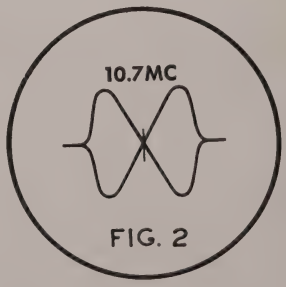


FIG. 2

ALIGNMENT FIGURES

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA TYPE
V1	FM RF Amplifier	ECC85/6AQ8
V2	FM Mixer-Osc.	ECC85/6AQ8
V3	1st FM IF Amp.	6AU6
V4	2nd FM IF Amp.	6AU6
V5	3rd FM IF Amp.	6AU6
V6	FM Tuning Indicator	EM84 (6FG6/EM84)*
V7	AM RF Amplifier	6BA6
V8	AM Mixer-Osc.	ECH81/6AJ8
V9	AM IF Amp. -AM Det.	EBF89/6DC8(EBF89)*
V10	AM Tuning Indicator	EM84 (6FG6/EM84)*
V11	Channel A Preamp.	ECC83/12AX7 (7025)*
V12	Channel A AF Amp.	ECC83/12AX7 (7025)*
V13	Channel A AF Amp. - Channel B AF Amp.	ECC83/12AX7 (7025)*
V14	Channel B Preamp.	ECC83/12AX7 (7025)*
V15	Channel B AF Amp.	ECC83/12AX7 (7025) *
V16	Rectifier	EZ80 (EZ80/6V4) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	C670-125	AFH3-44	C0870 BR4025	FP327.89	TMT-181	TVLS-3561.4*	
B	■40	250							
C	▲40	250							
C2A	▲40	250	C50180-5	AFH2-57	B0450	FP217.87	TMD-38	TVL-2575	
B	▲40	250							
C3A	▲500	30	C50180-6			WP065		TVL-2233	
B	▲500	30				TC2505			
C4	8	50	C629-138	PRS1405	NLW8-50	TT150X8	ML8-50	TE-1303.3	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	8 NPO ± .5mmf		NPO-SI 8.2		C10V8C			NPO-SI 8.2
C6		#C662-123						
C7	100 N1500 1000V	#C50070-6				*		
C8	100 N1500 1000V	#C50070-6				*		
C9	1000		EF-001	MFT-1000		CCF-102	CT280A	
C10	1000		EF-001	MFT-1000		CCF-102	CT280A	
C11	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C12	1000		EF-001	DD-102		CCF-102	CT280A	
C13	8 NPO ± .5mmf	(5) †	NPO-SI 8.2		C10V8C			NPO-SI 8.2
C14		#C662-123						
C15	24 N150 1000V 10%	#C50070-8				*		10TCP-Q22
C16	47 N750 1000V 10%				C10Q24C	CCTN-470	CN7-447	10TCU-Q47
C17	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C18	5 N150 ± .5mmf	#CC20PJ050D5				*		10TCP-V50
C19	5 N220 ± .5mmf	#CC20RH050D5				*		10TCR-V50
C20		#C662-123						
C21	100 N1500 1000V 10%	#C50070-6				*		
C22	100 N1500 1000V 10%	#C50070-6				*		
C23	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C24	1000		EF-001	MFT-1000		CCF-102	CT280A	
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C26	1000		EF-001	MFT-1000		CCF-102	CT280A	
C27	1000		EF-001	MFT-1000		CCF-102	CT280A	
C28	1000		EF-001	MFT-1000		CCF-102	CT280A	
C29	100 N1500 1000V 5%	#C50070-19				*		
C30	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C32	2700		DI-2700	DD-272	L10D27	CCD-272	GP227	10TS-D27
C33	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C34	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C35	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C36	2700		DI-2700	DD-272	L10D27	CCD-272	GP227	10TS-D27
C37	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C38	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	2700		DI-2700	DD-272	L10D27	CCD-272	GP227	10TS-D10
C40	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C41	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C42	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C43	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C44	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C45	.0033 200V 5%		V84C4D33-5%		1R5D33	CM-20B-332J	MCJ462	5BF-D33
C46	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104		4TM-P1
C47	24 N150 1000V 5%	#C50070-8				*		10TCP-Q22
C48	100 N1500 1000V	#C50070-6				*		
C49	18 N470 1000V 5%	#C50070-13				*		
C50	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C51	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C52	.68		NPO-SI .68	TCZ-R68				
C53	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C54	10 NPO ± .5mmf		NPO-DI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C55	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C56	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C57	100 N1500 1000V	#C50070-5				*		
C58	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C59	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C60	10 NPO ± .5mmf		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C61	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C62	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C63	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C64	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C65	.68 10%		NPO-SI .68	TCZ-R68				
C66	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C67	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C68	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C69	820 5%		1469-00082		1R5T82	CM-19B-821J		MS-382
C70	820 5%	Note 1	1469-00082		1R5T82	CM-19B-821J		MS-382
C71	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C72	100 N1500 1000V	#C50070-5				*		
C73	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C74	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C75	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C76	24 N150 1000V 5%	#C50070-8(39)†				*		10TCP-Q22
C77	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C78	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C79	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C80	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C81	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C82	20000	(50000) †	BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C83	47 N750 1000V 10%	(39) †			C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C84	1000 10%	(1500) †	DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C85	2200 10%	(2700) †	DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C86	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C87	82 N1500 1000V 10%	#C50070-7				*		
C88	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C89	47 N750 1000V 10%	(18) †			C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C90	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C91	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C92	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C93	100 N1500 1000V	#C50070-5				*		
C94	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C95	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C96	50000		BPD-05	DD-503	PM6S5	6DP-3-503	GP150	5HK-S50
C97	24 N150 1000V 5%	#C50070-8(39)†				*		10TCP-Q22
C98	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP150	5HK-S20
C99	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C100	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C101	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C102	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C103	20000	(50000) †	BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C104	68 N750 1000V 10%				C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C105	1000 10%	(1500) †	DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C106	2200 10%	(2700) †	DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C107	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C108	82 N1500 1000V 10%	#C50070-7				*		
C109	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C110	47 N750 1000V 10%	(18) †			C10Q47U	CCTN-470	CN7-447	10TCU-Q47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C111	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C112	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C113	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C114	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C115	.01 600V		P688N-01	DF-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1

Fisher Part Number.
† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Switch		R50160-32					Loudness Switch
B	500K	½						Volume, Channel B
	100K Tap							
C	500K	½						Volume, Channel A
	100K Tap							
D	Switch							Power Off-On
R2A	250K	½	R50160-33	B-50	AD47-250K-S		FA254L	Balance, Channel B
B	250K	½		SR-50	Not Req.		RU254L	Balance, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	1meg	½	R50106-34					Treble, Channel B
	100K Tap							
B	1meg	½						Treble, Channel A
	100K Tap							
C	Shaft							
R4A	1meg	½	R50106-35					Bass, Channel B
	100K Tap							
B	1meg	½						Bass, Channel A
	100K Tap							
C	Shaft							
R5	250K	1/4	R50160-3	JL-254				Phono Level, Channel B
R6	250K	1/4	R50160-3	JL-254				Phono Level, Channel A
R7	250K	1/4	R50160-3	JL-254				AM Level
R8	100K	1/4	R50160-20	JP-104				MTX Stereo Separation

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	270Ω	
R10	47K	
R11	3.3meg	
R12	1meg	
R13	100K	
R14	330K	
R15	330K	
R16	470K	
R17	1000Ω	
R18	22Ω	
R19	2200Ω	
R20	68K	
R21	1000Ω	
R22	2200Ω 1W	
R23	33K 1W	
R24	1000Ω	
R25	47K	
R26	1000Ω	
R27	150Ω	
R28	150Ω	
R29	1000Ω	
R30	62K	
R31	270Ω	
R32	56K	
R33	68K	
R34	10meg	
R35	470K	
R36	68K	
R37	1500Ω	
R38	6800Ω	
R39	1000Ω	
R40	6800Ω	
R41	180K	
R42	1000Ω	
R43	470Ω	(4700Ω) *
R44	2.2meg	
R45	820K	
R46	47K	
R47	100Ω	
R48	33K 1W	
R49	47K	
R50	220Ω	
R51	270Ω	
R52	270Ω	
R53	27K	
R54	180Ω	
R55	1000Ω	
R56	39K	
R57	82K	
R58	470K	
R59	68K	
R60	4.7Ω	
R61	47K	
R62	10K	
R63	330K 1W	
R64	2700Ω 1W	
R65	10Ω	
R66	4.7meg	
R67	220K	
R68	470K	(5.6meg) *
R69	2.2meg	
R70	3.3meg	
R71	100K	
R72	220K	
R73	560Ω	
R74	220K	
R75	15K	
R76	39K	
R77	10meg	
R78	470K	(22uK) *
R79	4.7meg	(2.2meg) *
R80	2.2meg	
R81	100K	
R82	560Ω	
R83	220K	
R84	22meg	
R85	100K	
R86	3.3meg	(1.5meg) *
R87	330K	
R88	22K	
R89	220K	
R90	2.2meg	
R91	220K	
R92	47K	
R93	10K	
R94	330K 1W	
R95	2700Ω 1W	
R96	10Ω	
R97	4.7meg	
R98	220K	
R99	470K	(5.6meg) *
R100	2.2meg	
R101	3.3meg	
R102	100K	
R103	220K	
R104	560Ω	
R105	220K	
R106	15K	
R107	39K	
R108	10meg	
R109	470K	(220K) *
R110	4.7meg	(2.2meg) *
R111	2.2meg	
R112	100K	
R113	560Ω	
R114	220K	
R115	22meg	
R116	160K	
R117	3.3meg	(1.5meg) *
R118	330K	
R119	22K	
R120	330Ω 5W	
R121	270Ω 5W	
R122	1000Ω	
R123	10K	
R124	30Ω 5W	
R125	220Ω	
R126	220Ω	
R127	1.2meg	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		FISHER PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	L50066-8						3.3uh
L2	FM Ant. Trans.	L726-124						
L3	RF Choke	L50066-2	19-1000	19-1000	BC-561	4602		1uh
L4	RF Choke	L50066-19						.56uh
L5	Cathode Choke	L50066-19						.56uh
L6	RF Choke	L629-180 ①						
L7	FM RF Coil	L726-126						
L8	FM Osc. Coil	L726-125						
L9	RF Choke	L50066-2	19-1000	19-1000	BC-561	4602		1uh
L10	RF Choke	L50066-3	19-1000	19-1000	BC-561	4602		1.2uh
L11	RF Choke	L50066-2	19-1000	19-1000	BC-561	4602		1uh
L12	1st FM IF Trans.	ZZ662-117	16-3400	16-3490		1463-PC		
L13	Cathode Choke	L50066-19						.56uh
L14	Fil. Choke	L50066-3	19-1000	19-1000	BC-561	4602		1.2uh
L15	2nd FM IF Trans.	ZZ2987	16-3487	16-3487	FM-254	1463		
L16	3rd FM IF Trans.	L670-145						
L17	Ratio Det.	ZZ592-170	17-3498	17-3498	FM-255	1465		
L18	AM Ant. Coil	L721-139						
L19	Loopstick	L721-136			BC-419			
L20	AM RF Trans.	L556-125						
L21	AM Osc. Coil	L50210-21						
L22	1st AM IF Trans.	ZZ50210-1						
L23	2nd AM IF Trans.	ZZ2984	16-6758	16-6758	BC-353	12-C2	RF-2	
L24	10KC Filter	L644-120						

① Wound on 100Ω resistor.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .67A	450 VCT @ .075A	6.3V @ 2.3A	T755-115						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.1A	6.3V NOT USED	24V @ .480A							

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FISHER PART No.	REPLACEMENT DATA
K1	Input Comp.	390mmf, 1500mmf, 270K, 2meg	PC50187-3	
K2	Hi Filter Comp.	(2) 100mmf, 220mmf, (2) 100K	PC50187-2	
K3	Input Comp.	390mmf, 1500mmf, 270K, 2meg	PC50187-3	
K4	Hi Filter Comp.	(2) 100mmf, 220mmf, (2) 100K	PC50187-2	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	FISHER PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.300A	*					* Selenium Bridge

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			FISHER PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2	3AG	2A 250V	F755-145		312003 (3AG 2A 250V)	342001	AGC 3	HKP	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		FISHER PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N541		1N636	1N295	1N295	Ratio Det. (Pigtail)
M4	1N541		1N636	1N295	1N295	Ratio Det. (Pigtail)

MISCELLANEOUS

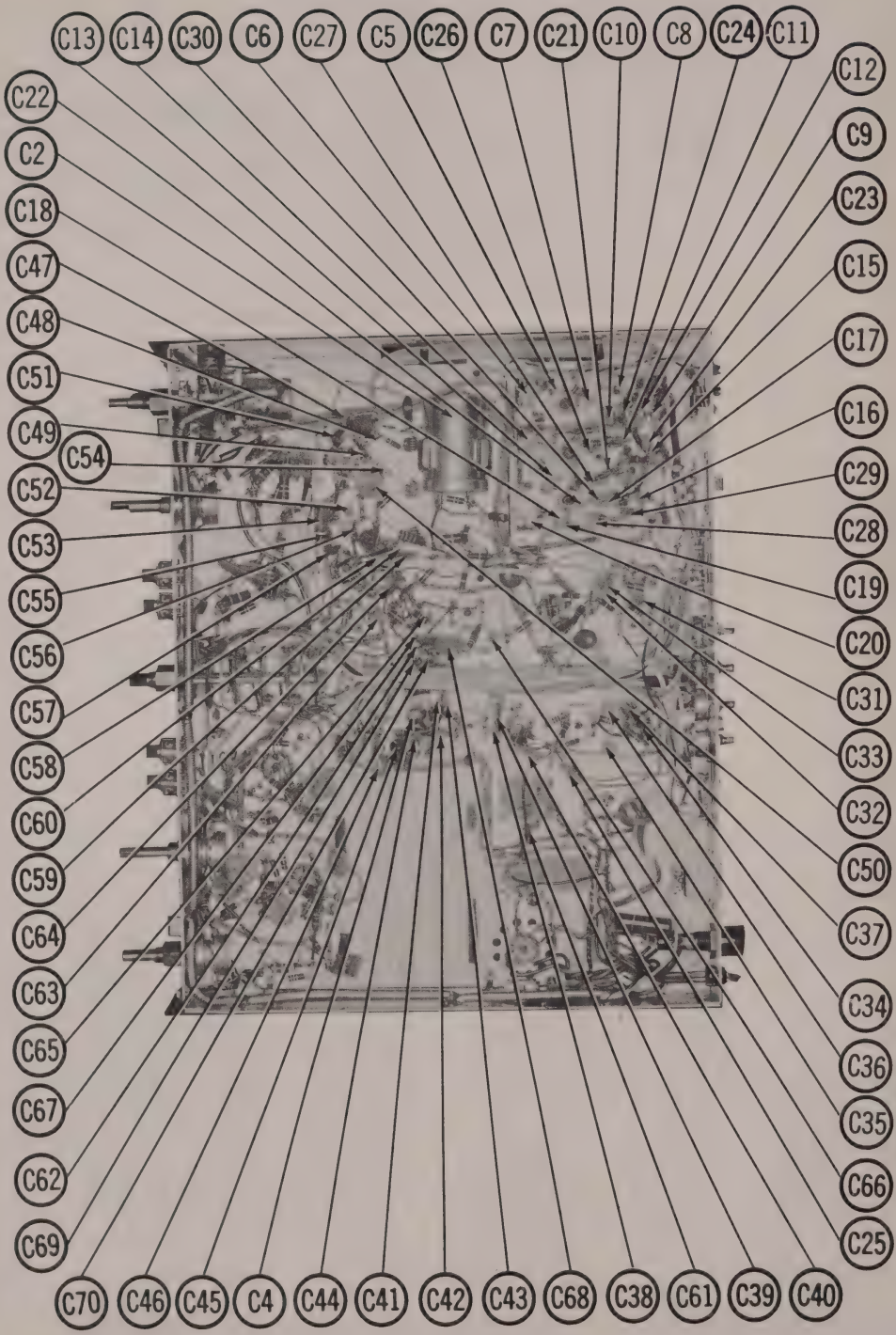
ITEM No.	PART NAME	FISHER PART No.	NOTES
M5	Tuning Cap.	C726-116	FM, 3 Gang
M6	Tuning Cap.	C684-127	AM, 3 Gang (Ant. 10-505mmf, RF 10-503mmf, Osc. 7-138mmf)
M7	Switch	S755-116	Selector (Rotary Wafer)
M8	Switch	S50200-2	AM Broad-Sharp (DPDT Slide Type)
M9	Switch	S50200-2	Main Channel-MPX Channel (DPDT Slide Type)
M10	Switch	S50200-2	Hi Filter (DPDT Slide Type)
M11	Switch	S50200-2	Lo Filter (DPDT Slide Type)
M12	Switch	S50200-2	Normal-Reverse (DPDT Slide Type)

WIRING DATA

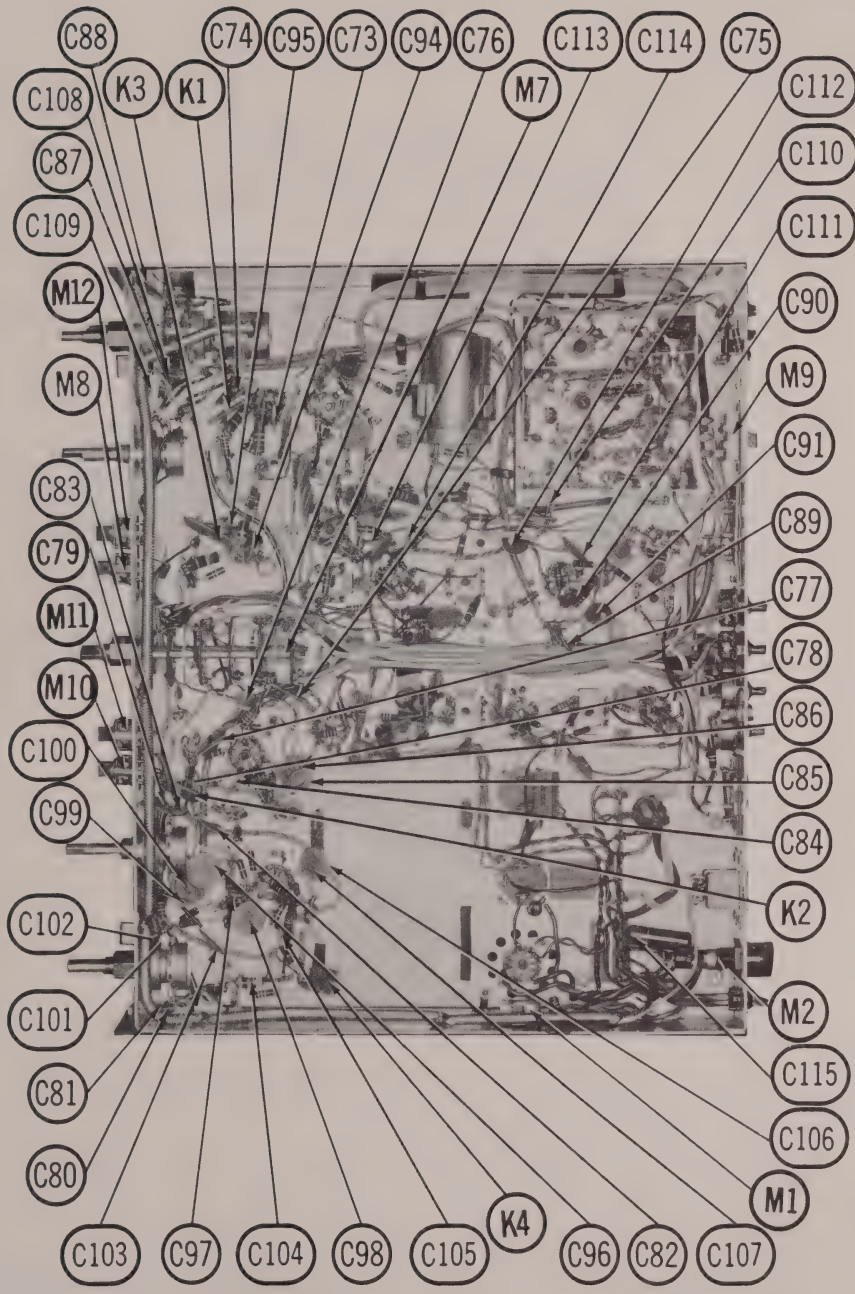
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

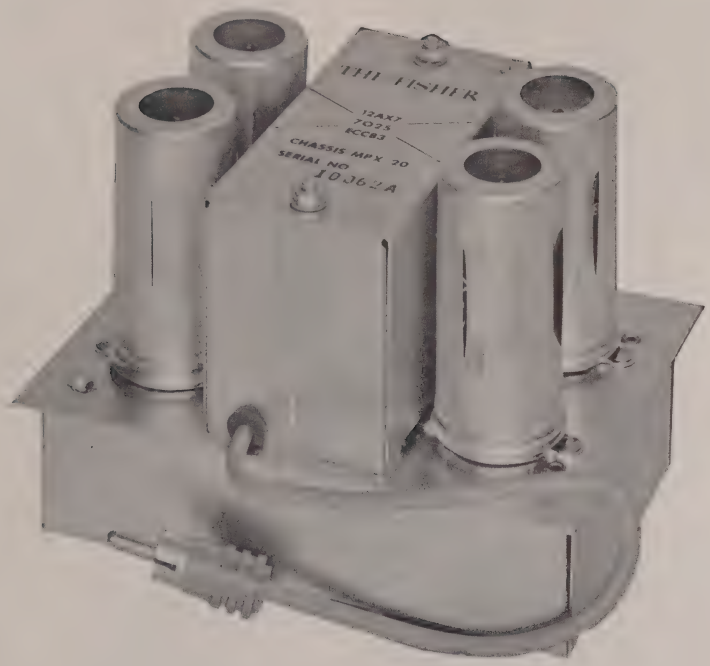


CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

PHOTOFACT® Folder

**FISHER MODEL
MPX-20**

FISHER MODEL
MPX-20



FISHER MODEL
MPX-20

TRADE NAME	Fisher Model MPX-20
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, New York
TYPE SET	Externally Powered 4 Tube Multiplex Adaptor

SET493 FOLDER 8

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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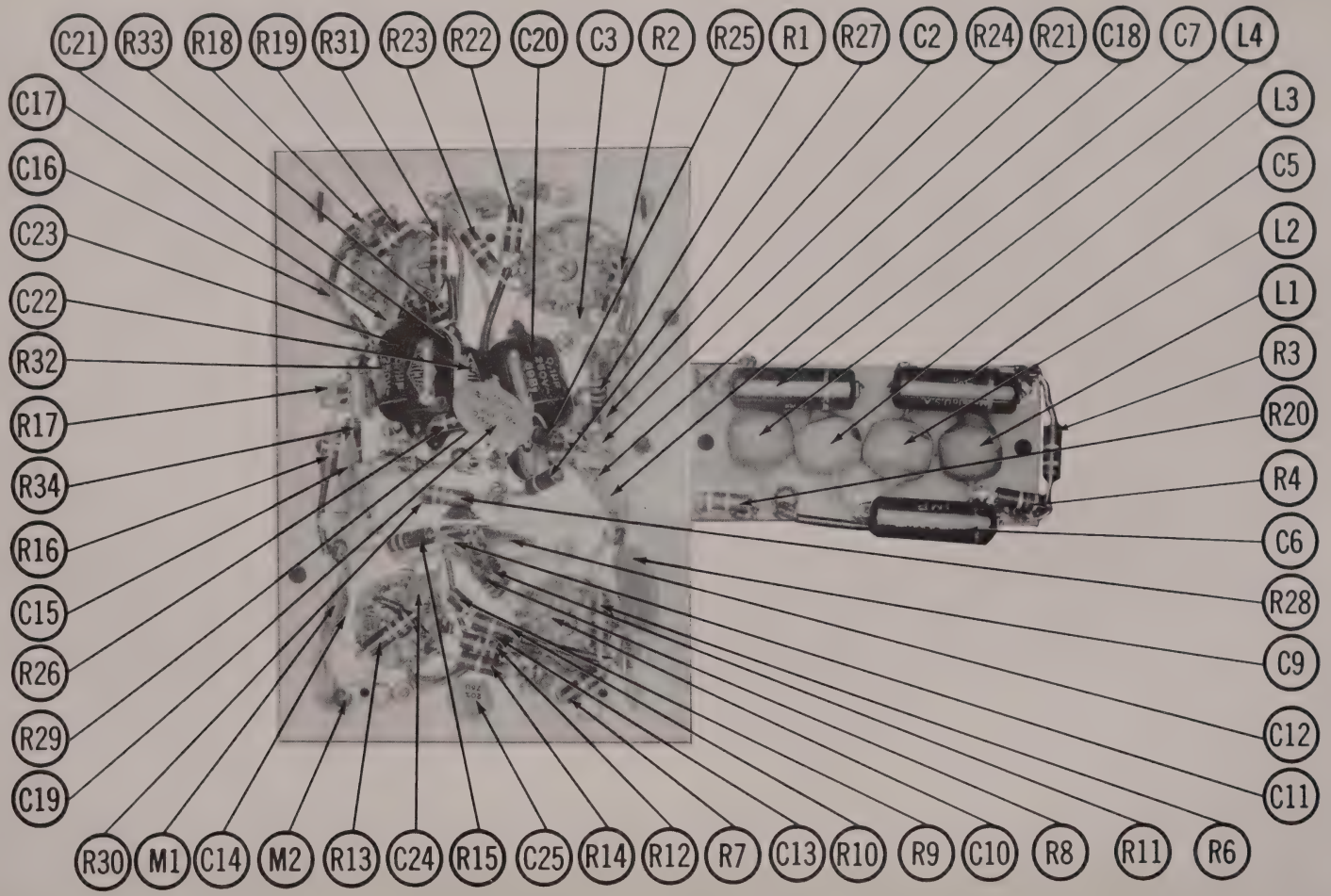


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA TYPE
V1	Sub Carrier Cath. Follower - Main Channel AF Amp	ECC83/12AX7 (7025)*
V2	Sub Carrier Amp	ECC83/12AX7 (7025)*
V3	Sub Carrier Amp	ECC83/12AX7 (7025)*
V4	Sub Carrier Amp - Matrix Amp	ECC83/12AX7 (7025)*

*Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	20	250	C746-145	PRS1570	BR2025	TC55	TD-20-250	TVA-1508	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 1000V N1500 10%	#C50070-6				*		
C3	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C4	.0082 200V 5%				1DR3D82	CM-40-B-822J		5BF-D82
C5	.0082 200V 5%				1DR3D82	CM-40-B-822J		5BF-D82
C6	.003 200V 5%				1R5D3	CM-40-B-302J		
C7	.0082 200V 5%				1DR3D82	CM-40-B-822J		5BF-D82
C8	.0082 200V 5%				1DR3D82	CM-40-B-822J		5BF-D82
C9	50000 100V		BPD-05	DD-503	WMFIS47E	1DP-2-503	GP150	5HK-S50
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C12	50000 100V		BPD-05	DD-503	WMFIS47E	1DP-2-503	GP150	5HK-S50
C13	1000		BPD-001	DD-102	BYA1001	CCD-102	GP210	5HK-D10
C14	24 1000V N150 5%	#C50070-8				*		
C15	2200 10%		DI-2200		1R5D22	CCD-222	GP222	10TS-D22
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C17	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C18	56 1000V N1500 5%	#C50070-22				*		
C19	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C20	.1 250V		P488N-1	DF-104	WMF1P1E	4DP-3-104	GEM-401	2TM-P1
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C22	.1 250V		P488N-1	DF-104	WMF1P1E	4DP-3-104	GEM-401	2TM-P1
C23	.1 250V		P488N-1	DF-104	WMF1P1E	4DP-3-104	GEM-401	2TM-P1
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Fisher Part Number

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	68K	
R2	22meg	
R3	1800Ω	
R4	560Ω	
R5	1000Ω	
R6	220K	
R7	1500Ω	
R8	470K	
R9	100K	
R10	1000Ω	
R11	1500Ω	
R12	470K	
R13	33K	
R14	1000Ω	
R15	33K	
R16	330K	
R17	2.2meg	
R18	22meg	
R19	100K	
R20	3900Ω	
R21	330K	
R22	22meg	
R23	100K	
R24	3.3meg	
R25	100K	
R26	100K	
R27	100K	
R28	56K	
R29	56K	
R30	100K	
R31	10K	
R32	10K	
R33	22meg	
R34	1meg	
R35	220Ω	
R36	220Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA FISHER PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke	L734-137		19-1065				4MH
L2	RF Choke	L734-136		19-1063				1.6MH
L3	RF Choke	L734-136		19-1065				1.6MH
L4	RF Choke	L734-137		19-1063				4MH

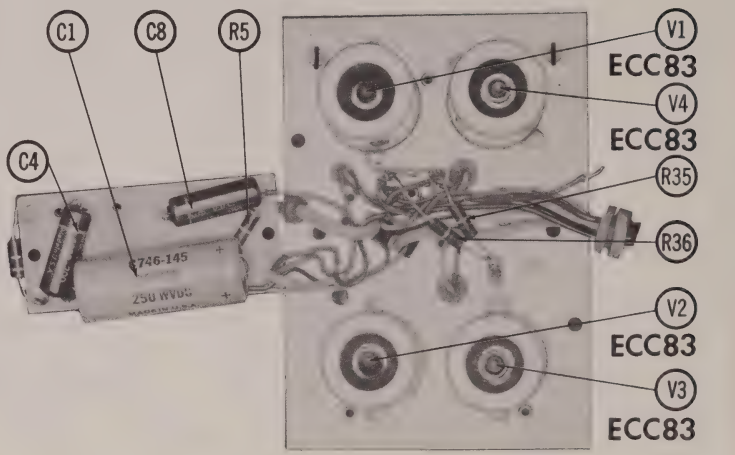
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA FISHER PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1		V-RL232 *	1N295	1N295	1N295	
M2		V-RL232 *	1N295	1N295	1N295	

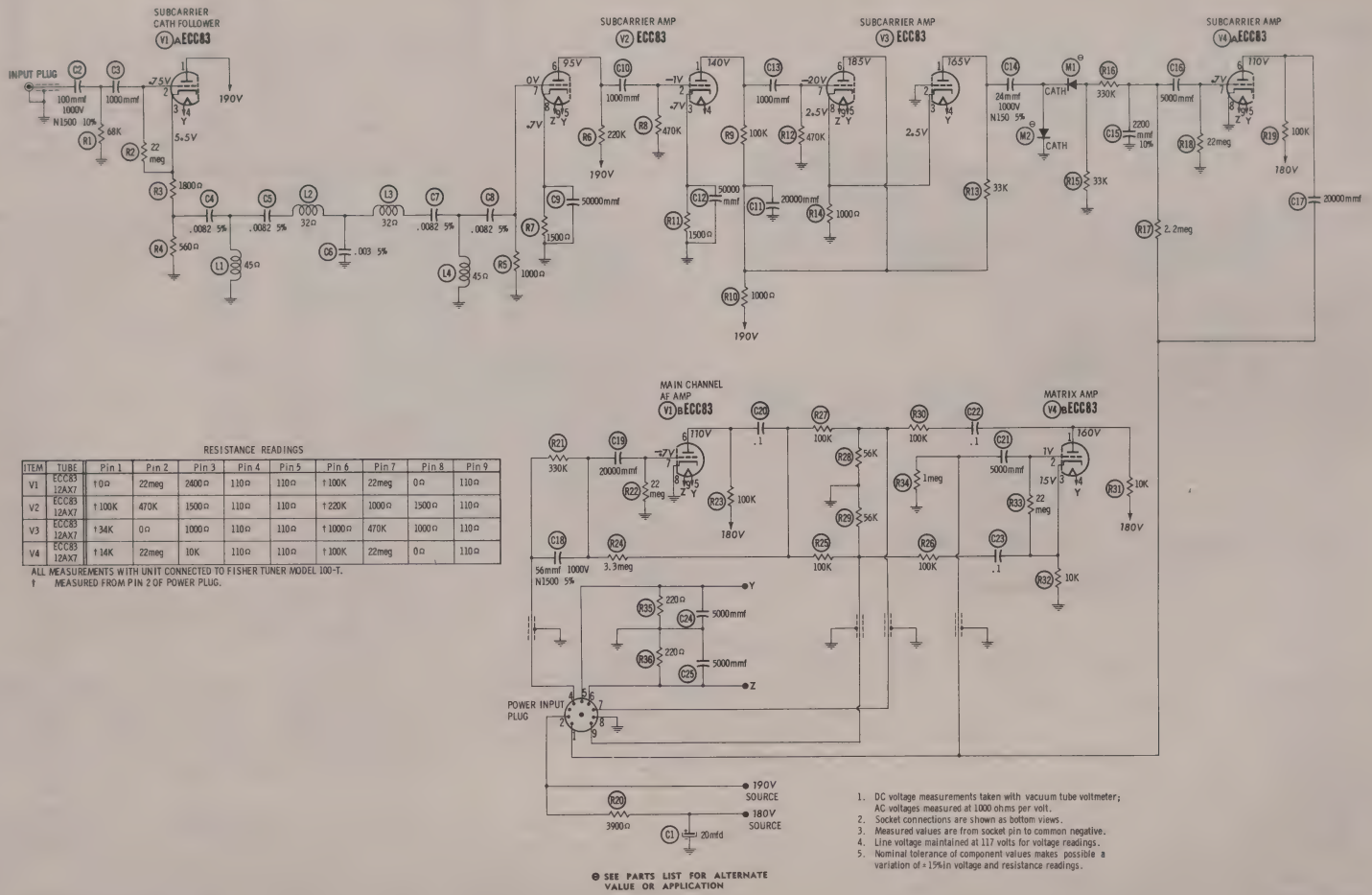
*Part #V-1N541 or V-1N295 may be used in this application

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS—TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†0Ω	22meg	2400Ω	110Ω	110Ω	†100K	22meg	0Ω	110Ω
V2	ECC83 12AX7	†100K	470K	1500Ω	110Ω	110Ω	†220K	1000Ω	1500Ω	110Ω
V3	ECC83 12AX7	†34K	0Ω	1000Ω	110Ω	110Ω	†1000Ω	470K	1000Ω	110Ω
V4	ECC83 12AX7	†14K	22meg	10K	110Ω	110Ω	†100K	22meg	0Ω	110Ω

ALL MEASUREMENTS WITH UNIT CONNECTED TO FISHER TUNER MODEL 100-T.
† MEASURED FROM PIN 2 OF POWER PLUG.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.

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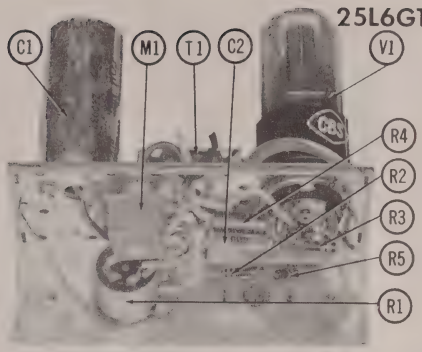
FISHER MODEL MPX-20

PHOTOFACT® Folder

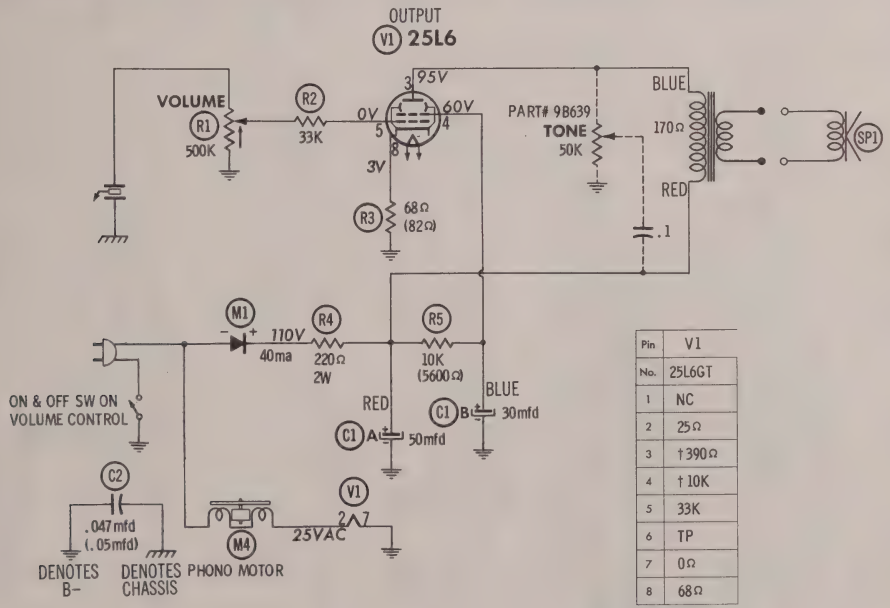
HARMONY MODEL 204

HARMONY
MODEL 204



TRADE NAME	Harmony Model 204
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated One Tube Phono Amplifier With 3 Speed Manual Record Player
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 39 Watts, .43 Amp. @117 Volts AC (Less Motor)

HARMONY
MODEL 204



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	†390Ω
4	†10K
5	33K
6	TP
7	0Ω
8	68Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

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JR898

SET493 FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	25L6GT (Note 1)			

Note 1. Some versions may use 25EH5.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HARMONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	11B759	PRS2200	BBRD5315	WD210	TDLD-8	TVA-2450	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARMONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	9B612	B-60-S	A47-500K-S	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	68Ω	(82Ω) *

ITEM No.	RATING	REMARKS
R4	220Ω 2W	

ITEM No.	RATING	REMARKS
R5	10K	(5600Ω) *

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1900Ω	3-4Ω	3B241	24S53	A-3026	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HARMONY PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	1B102	4A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	HARMONY PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.040A	10B603 *	RS065 *	1234AH *	65 *		* Selenium Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	HARMONY PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	ST-40	420TS TB	N8-1 N8-3					2T-S	N-2T-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HARMONY PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)	W-64S † or W-64D ♦	CRA-55 † or CRA-55D ♦	† Jewel ♦ Diamond
	(LP)	W-64MGS † or W-64MGD ♦	CRA-55LP † or CRA-55LPD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	HARMONY PART No.	NOTES
M4	Motor Idler Wheel	6B314	90V, 3 Speed Walsco Part No. 1433

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B519	
Cabinet	17B869	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

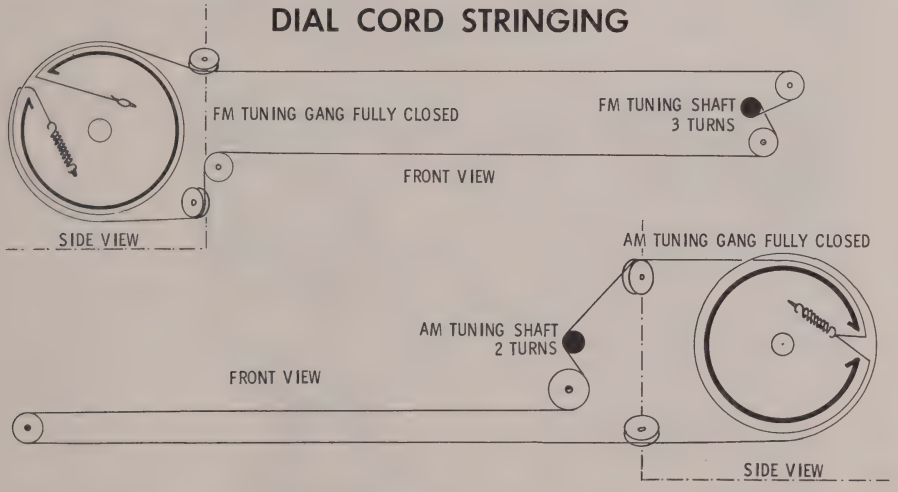
KNIGHT MODEL KN-125 (92SU428)

KNIGHT MODEL
KN-125 (92SU428)

KNIGHT MODEL
KN-125 (92SU428)

TRADE NAME	Knight Model KN-125 (92SU428)		
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois		
TYPE SET	AC Operated 15 Tube FM-AM Tuner		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	67 Watts, .6 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	520 — 1630KC	FREQ. MOD.	88 — 108MC

DIAL CORD STRINGING



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JL805

SET 493 FOLDER 10

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	0Ω	180Ω	0Ω	.3Ω	†4800Ω	†4800Ω	0Ω		
V2	6AB4	†4800Ω	0Ω	.3Ω	0Ω	TP	0Ω	1000Ω		
V3	12AT7	†13K	■470K 4meg	330Ω	.3Ω	0Ω	†8200Ω	10K	.3Ω	0Ω
V4	6CB6	.8Ω	180Ω	.3Ω	0Ω	†7300Ω	†7300Ω	0Ω		
V5	6CB6	.8Ω	180Ω	.3Ω	0Ω	†7300Ω	†7300Ω	0Ω		
V6	EM84	1.5meg	†2600Ω	0Ω	0Ω	.2Ω	†2600Ω	†470K	†2600Ω	†470K
V7	6AU6	100K	0Ω	.2Ω	0Ω	†30K	†30K	0Ω		
V8	6AU6	100K	0Ω	.2Ω	0Ω	†30K	†9400Ω	0Ω		
V9	6BJ8	100K	200K	0Ω	0Ω	.2Ω	100K	†1500Ω	510K	40K
V10	12AU7	†1500Ω	490K	20K	0Ω	0Ω	†1500Ω	495K	25K	.2Ω
V11	6BA6	2.4meg	0Ω	.2Ω	0Ω	†11K	†11K	0Ω		
V12	6BE6	22K	.6Ω	.2Ω	0Ω	†12K	†12K	1.6meg		
V13	6AS8	†4800Ω	1.9meg	390Ω	.2Ω	0Ω	300K	0Ω	0Ω	†4800Ω
V14	EM84	1.3meg	†2600Ω	0Ω	0Ω	.2Ω	†2600Ω	†470K	†2600Ω	†470K
V15	EZ80	87Ω	TP	¶	.2Ω	0Ω	TP	93Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "STEREO" POSITION UNLESS OTHERWISE DESIGNATED.

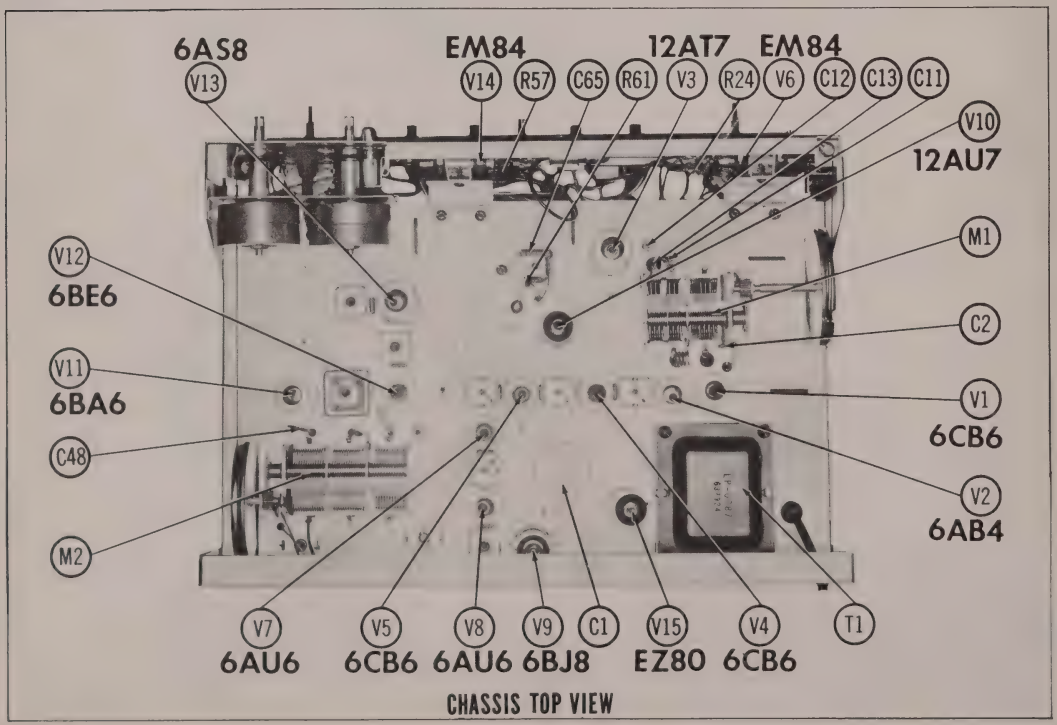
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

■ MEASURED IN "DSR OFF - AFC ON" POSITION.

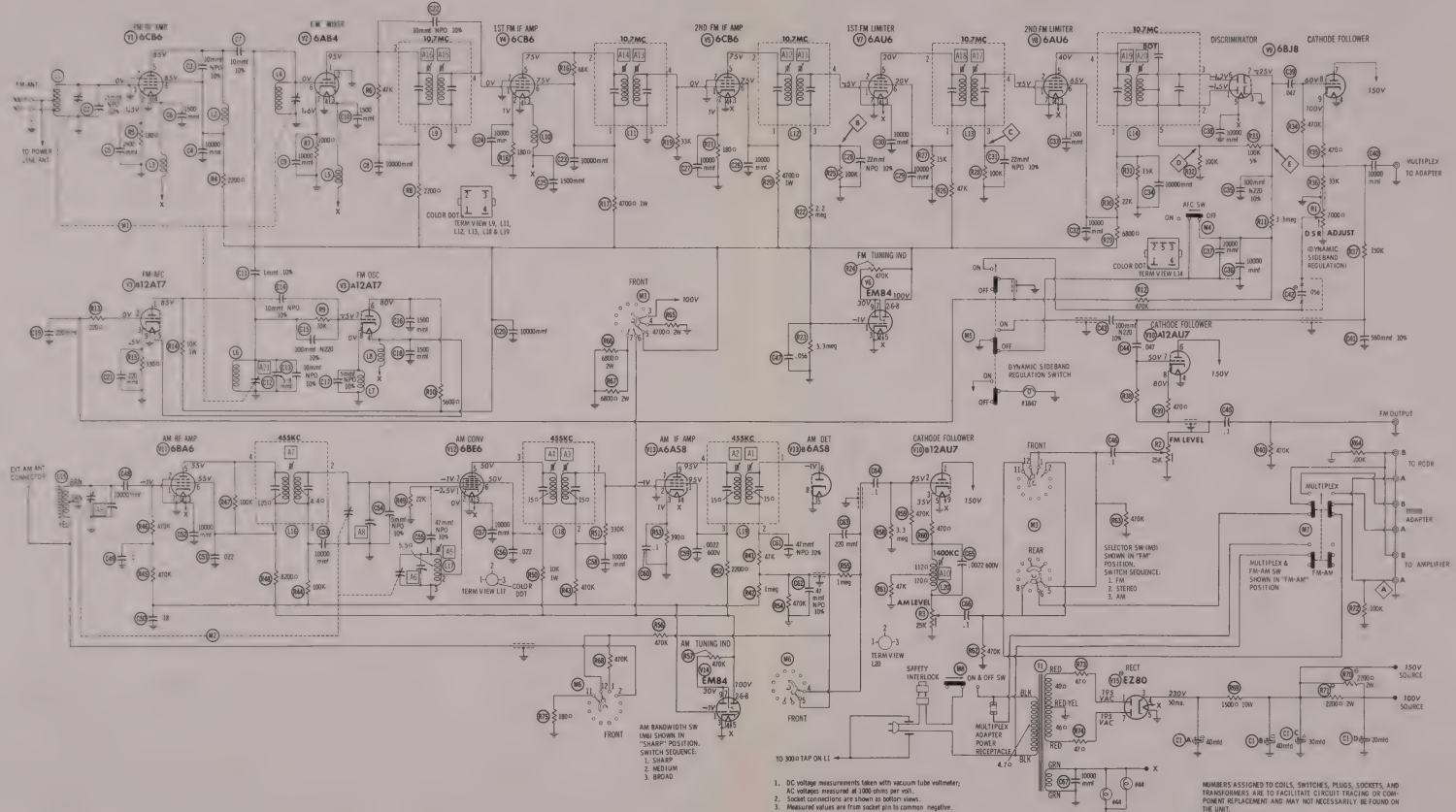
† MEASURED FROM PIN 3 OF V15.

NC NO CONNECTION

TP TIE POINT



CHASSIS TOP VIEW



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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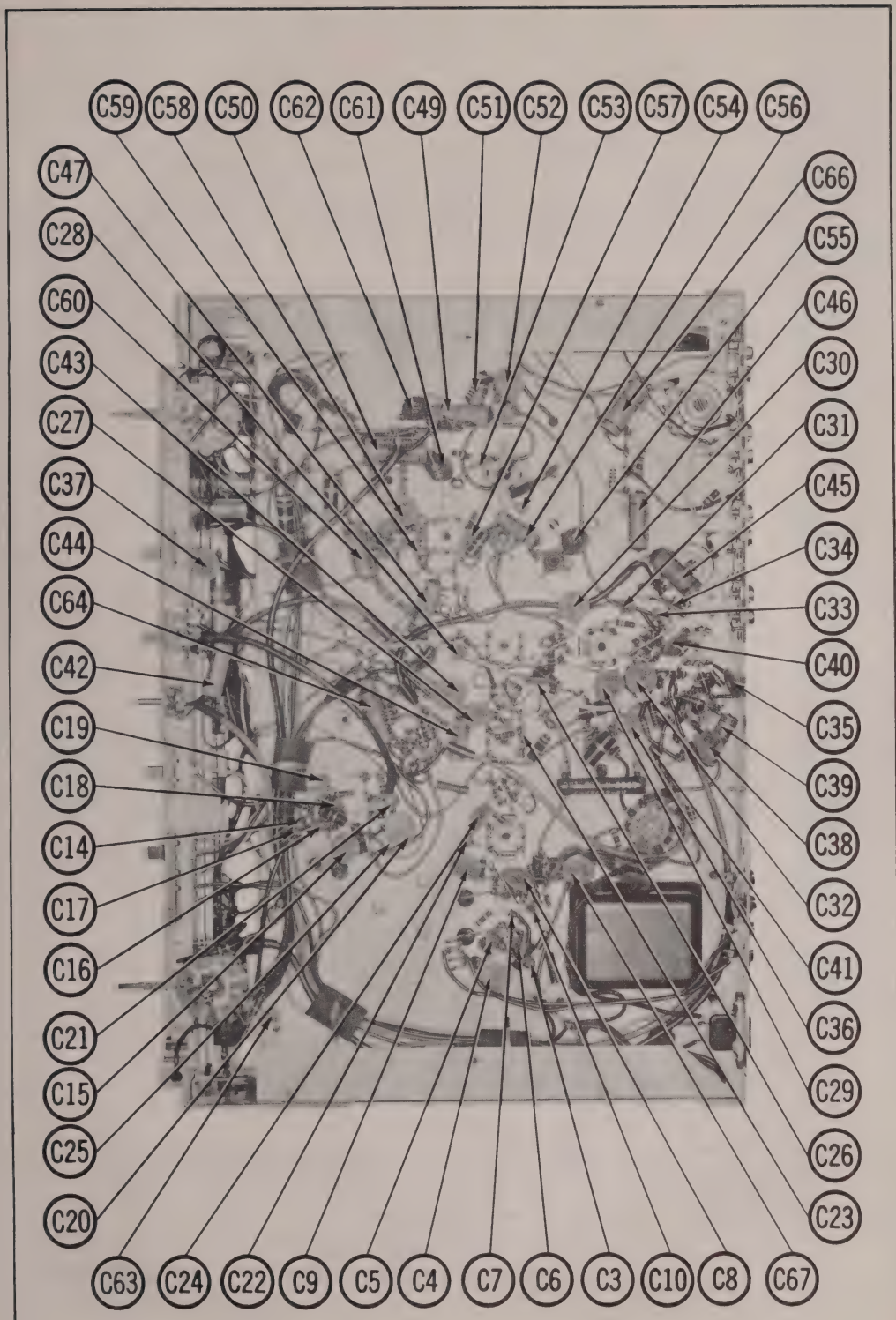
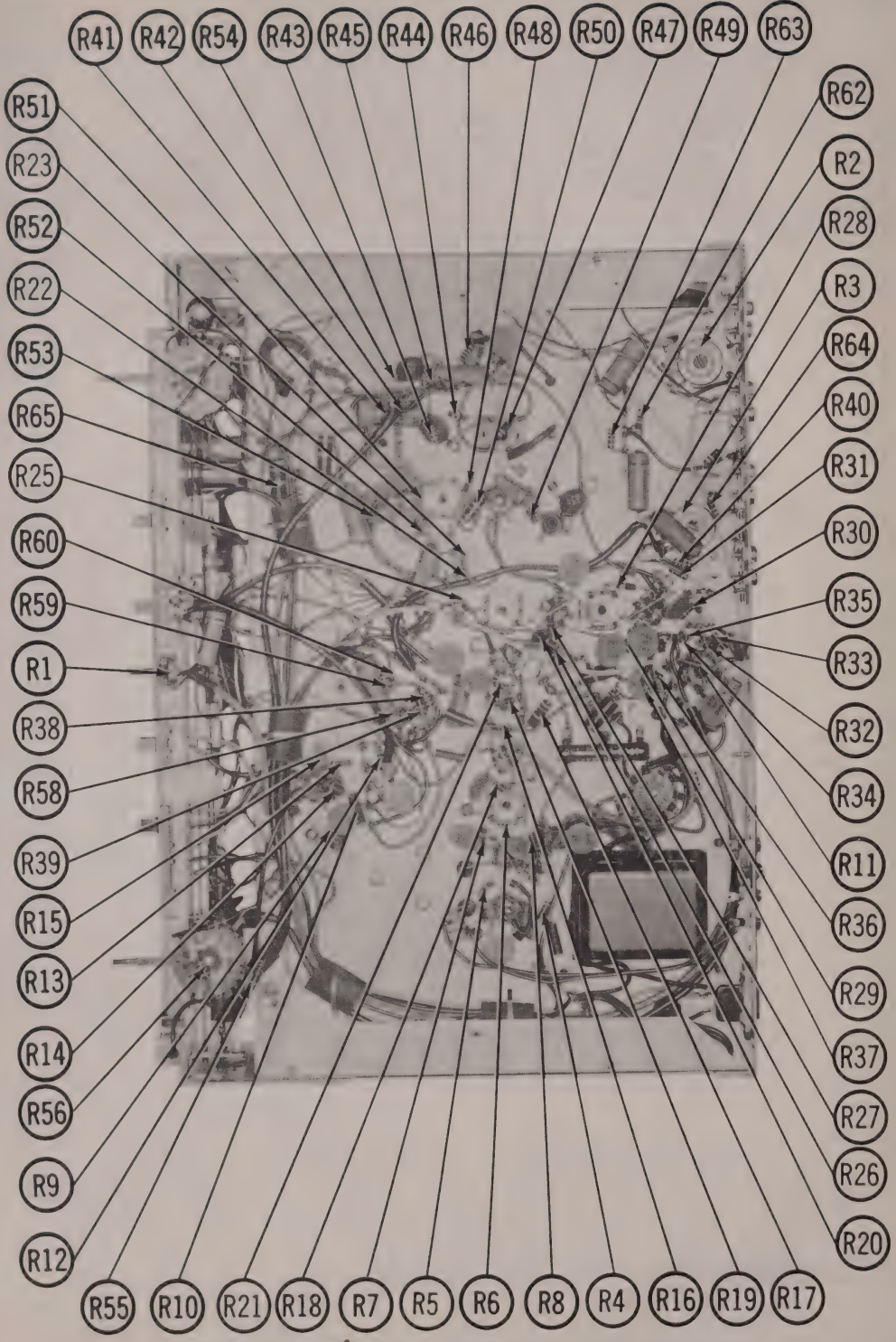
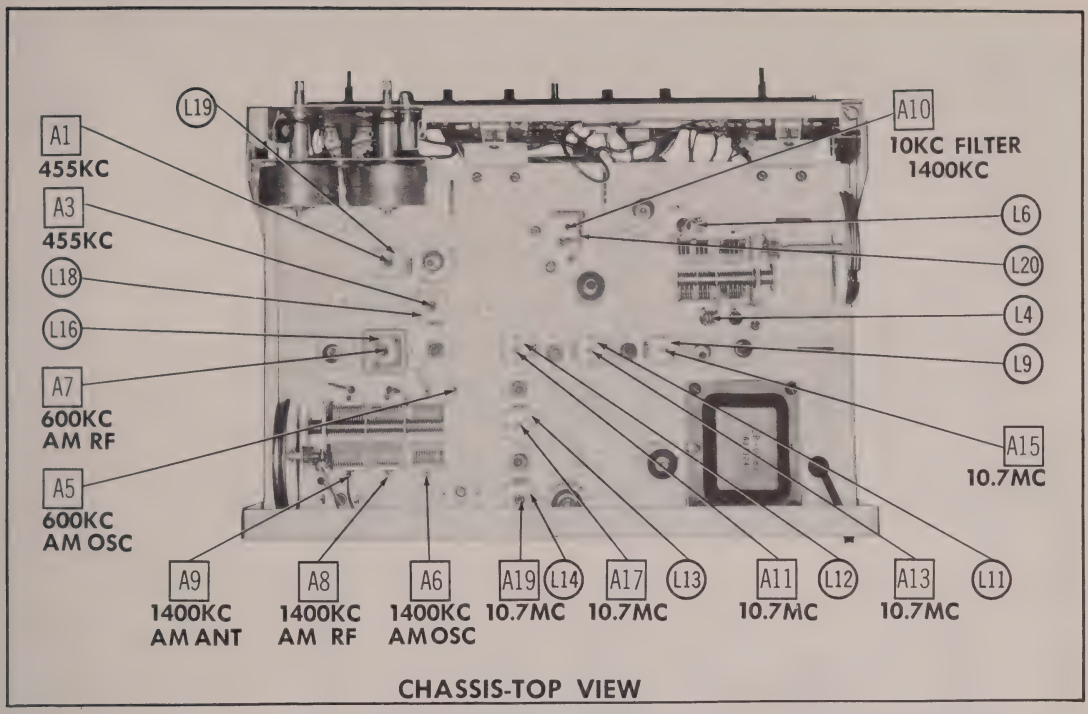
KNIGHT MODEL KN-125 (92SU428)



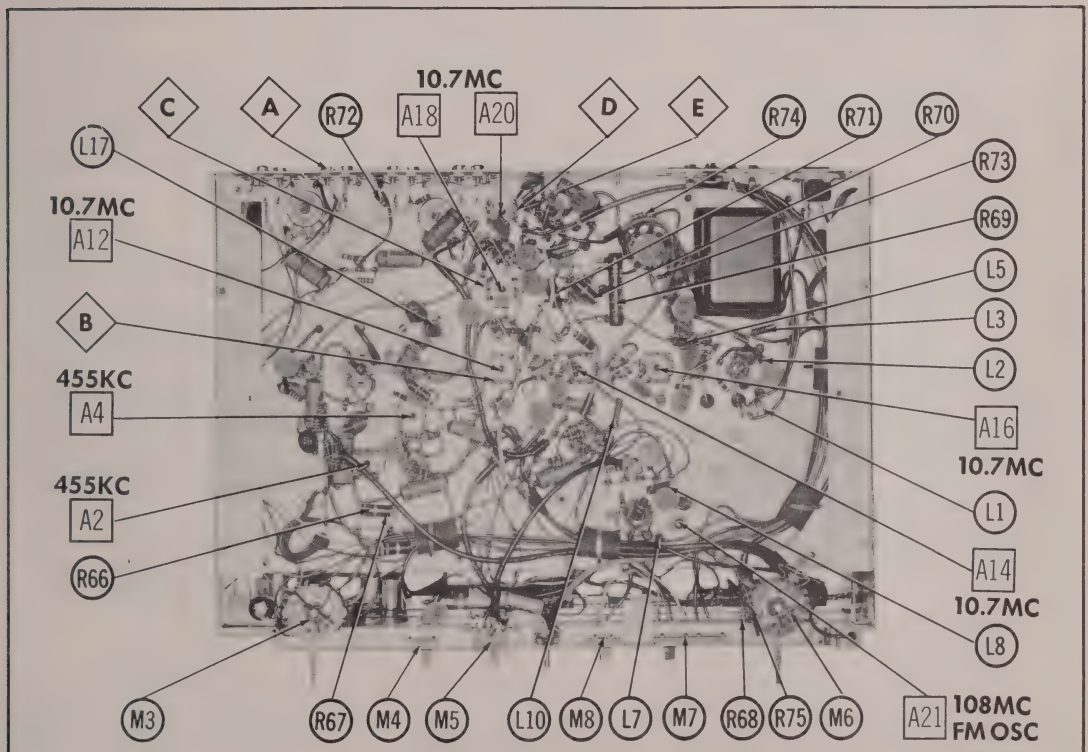
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested alignment tools:

A1 thru A4, A5, A7, A19, A20...	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A6, A8, A9, A21.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
All thru A18.....	GENERAL CEMENT #5097, 8727 WALSCO #2515

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open.	AC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	600KC	600KC	"	A5	"
3.	"	1400KC	1400KC	"	A6	"
4.	High side thru .01mfd to AM antenna terminal. Low side to chassis.	600KC	600KC	"	A7	"
5.	"	1400KC	1400KC	"	A8, A9	Adjust for maximum deflection. Repeat Steps 2 thru 5.
6.	"	1400KC (10KC Mod.)	1400KC	"	A10	Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

DSR and AFC "OFF"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	High side thru .01mfd to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (B). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
8.	"	"	"	DC probe to point (C). Common to chassis.	A17, A18	Adjust for maximum deflection. Repeat Step 7.
9.	"	"	"	DC probe thru 1meg to point (D). Common to chassis.	A19	Adjust for maximum deflection.
10.	"	"	"	DC probe to point (E). Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

DSR and AFC "OFF"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	High side thru .01mfd to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum gain and symmetry of response similar to Fig. 1.
8.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A17, A18	"
9.	"	"	"	Vert. amp. thru 27K to point (D). Low side to chassis.	A19	"
10.	"	"	"	Vert. amp. to point (E). Low side to chassis.	A20	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

DSR and AFC "OFF".

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	High side thru 270Ω to FM antenna terminal. Low side to chassis.	88MC (Unmod.)	(FM) 88MC	DC probe to point (B). Common to chassis.	L6	Adjust for maximum deflection.
12.	"	108MC	108MC	"	A21	Adjust for maximum deflection.
13.	"	88MC	88MC	"	L4, L1	Adjust for maximum deflection.

FIG. 1

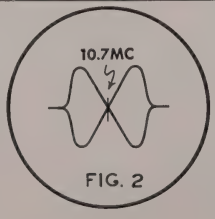


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	FM RF Amplifier	6CB6
V2	FM Mixer	6AB4
V3	FM Osc. -FM AFC	12AT7
V4	1st FM IF Amplifier	6CB6
V5	2nd FM IF Amplifier	6CB6
V6	FM Tuning Indicator	EM84
V7	1st FM Limiter	6AU6
V8	2nd FM Limiter	6AU6
V9	Discriminator-FM Cathode Follower	6BJ8
V10	FM Cathode Follower-AM Cathode Follower	12AU7
V11	AM RF Amplifier	6BA6
V12	AM Converter	6BE6
V13	AM IF Amp. -Det. -AVC	6AS8
V14	AM Tuning Indicator	EM84
V15	Rectifier	EZ80 (EZ80/6V4) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	CE137B	AFH4-02-10	D0022	FP419.5	TMT-23 TD-20-250	TVL-4580	
B	■40	300							
C	▲30	250							
D	20	200							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C3	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C6	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C7	10 10%		NPO-SI 10	TCZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C11	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C12	.5-8							
C13	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C14	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C15	100 N220 10%					*		10TCR-T10
C16	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C17	5 NPO 10%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C18	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C19	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C22	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	100 N220 10%					*		10TCR-T10
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	560 10%		DI-560	DD-561	1R5T56	CCD-561	GP356	10TS-T56
C42	.056 200V	Note 1	P684CM-056			4DP-3-563	GEM-6156	2WF-S56
C43	100 N220 10%					*		10TCR-T10
C44	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C45	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C46	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C47	.056 200V		P684CM-056			4DP-3-563	GEM-6156	2WF-S56
C48	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C50	.18 200V		P288N-2		CUB6P2	2DP-4-204	GEM-402	4TM-P2
C51	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	5 NPO 10%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C55	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C56	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C59	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C60	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C61	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C62	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C63	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C64	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C65	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C66	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C67	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

Note 1. Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	7000Ω	1/4	RP-702					Dynamic Sideband Regulation
R2A	25K	1/2	RP-253B		B47-25K-S	B13-120	TA253L	FM Level
B	Shaft				Not Req.	TM4	Not Req.	
R3A	25K	1/2	RP-253B		B47-25K-S	B13-120	TA253L	AM Level
B	Shaft				Not Req.	TM4	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	2200Ω	
R5	180Ω	
R6	47K	
R7	1000Ω	
R8	2200Ω	
R9	10K	
R10	5600Ω	
R11	3.3meg	
R12	470K	
R13	220Ω	
R14	10K 1W	
R15	330Ω	
R16	68K	
R17	4700Ω 1W	
R18	180Ω	
R19	33K	
R20	4700Ω 1W	
R21	180Ω	
R22	2.2meg	
R23	3.3meg	
R24	470K	
R25	100K	
R26	47K	
R27	15K	

ITEM No.	RATING	REMARKS
R28	100K	
R29	6800Ω	
R30	22K	
R31	15K	
R32	100K	
R33	100K 5%	
R34	470K	
R35	470Ω	
R36	33K	
R37	150K	
R38	470K	
R39	470Ω	
R40	470K	
R41	47K	
R42	1meg	
R43	470K	
R44	100K	
R45	470K	
R46	470K	
R47	100K	
R48	8200Ω	
R49	22K	
R50	10K 1W	
R51	330K	

ITEM No.	RATING	REMARKS
R52	2200Ω	
R53	390Ω	
R54	470K	
R55	1meg	
R56	470K	
R57	470K	
R58	3.3meg	
R59	470K	
R60	470Ω	
R61	47K	
R62	470K	
R63	470K	
R64	100K	
R65	4700Ω 2W	
R66	6800Ω 2W	
R67	6800Ω 2W	
R68	470K	
R69	1500Ω 10W	
R70	2200Ω 2W	Note 1
R71	2200Ω 2W	Note 1
R72	100K	
R73	47Ω	
R74	47Ω	
R75	180Ω	

Note 1. When R70 is 1100Ω 4W, R71 is not used.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		KNIGHT PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil							
L2	RF Choke		19-1003	19-1003	BC-564	4608		3.3uh
L3	Fil. Choke		19-1007	19-1007	BC-560	4590		.68uh
L4	FM RF Coil							
L5	Fil. Choke		19-1007	19-1007	BC-560	4590		.68uh
L6	FM Osc. Coil							
L7	Cathode Choke		19-1007	19-1007	BC-560	4590		.68uh
L8	Fil. Choke		19-1007	19-1007	BC-560	4590		.68uh
L9	1st FM IF Trans.	LR-0032	16-3487	16-3487	FM-254	1463		
L10	Fil. Choke		19-1007	19-1007	BC-560	4590		.68uh
L11	2nd FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L12	3rd FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L13	4th FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L14	Discriminator	LQ-0181	17-3494	17-3494	FM-253	1464		
L15	Loopstick		14-7002	14-7002	BC-418	705-A		
L16	AM RF Coil	LW-0125						
L17	AM Osc. Coil				BC-393	70-OSC		
L18	1st AM IF Trans.	LR-0041	16-6758	16-6758	BC-352	12-C1	RF-1	
L19	2nd AM IF Trans.	LR-0041	16-6758	16-6758	BC-353	12-C2	RF-2	
L20	10KC Filter							

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .6A	400 VCT @ .050A	6.3V@ 5.5A	LP-0287						

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Tuning Cap.		FM, 3 Gang
M2	Tuning Cap		AM, 3 Gang (Ant. 12-432mmf, RF 12-432mmf, Osc. 8-152mmf)
M3	Switch		Selector (FM-AM-Stereo) (Rotary Wafer Type)
M4	Switch		AFC Off-On (SPDT Slide Type)
M5	Switch		DSR Off-On (2P 3 Position Slide Type)
M6	Switch		AM Bandwidth (Sharp-Medium-Broad) (Rotary Wafer)
M7	Switch		FM-AM-MX (2P 3 Position Slide Type)
M8	Switch		Power Off-On (SPDT Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

PHOTOFACT® Folder

MOTOROLA MODELS SH18GL, N, SK24B, M, W (Ch. HS-765, HS-780)

MOTOROLA MODELS SH18GL, N, SK24B, M, W (Ch. HS-765, HS-780)

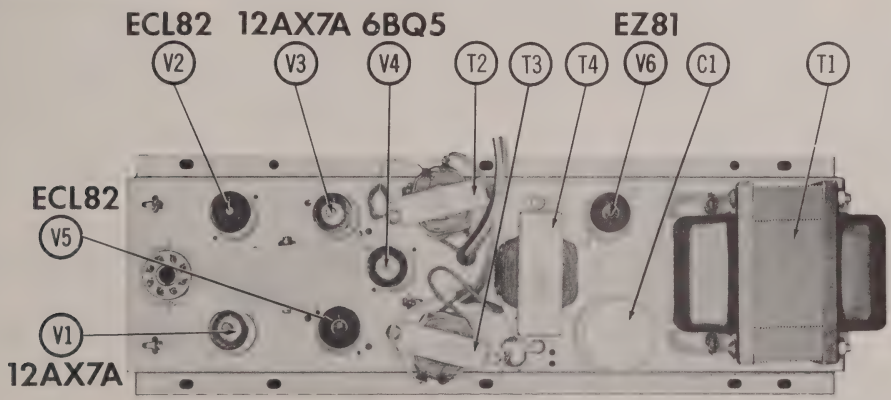
MODEL SK24B

MOTOROLA MODELS SH18GL, N, SK24B, M, W (Ch. HS-765, HS-780)

TRADE NAME	Motorola Models SH18GL, SH18N (Ch. HS-765); SK24B, SK24M, SK24W (Ch. HS-780)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 6 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 78 Watts, .74 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER VM30RC USED IN MODELS SH18 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12.

FOR SERVICE INFORMATION ON RECORD CHANGER BR10RC USED IN MODELS SK24 — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11.



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT035

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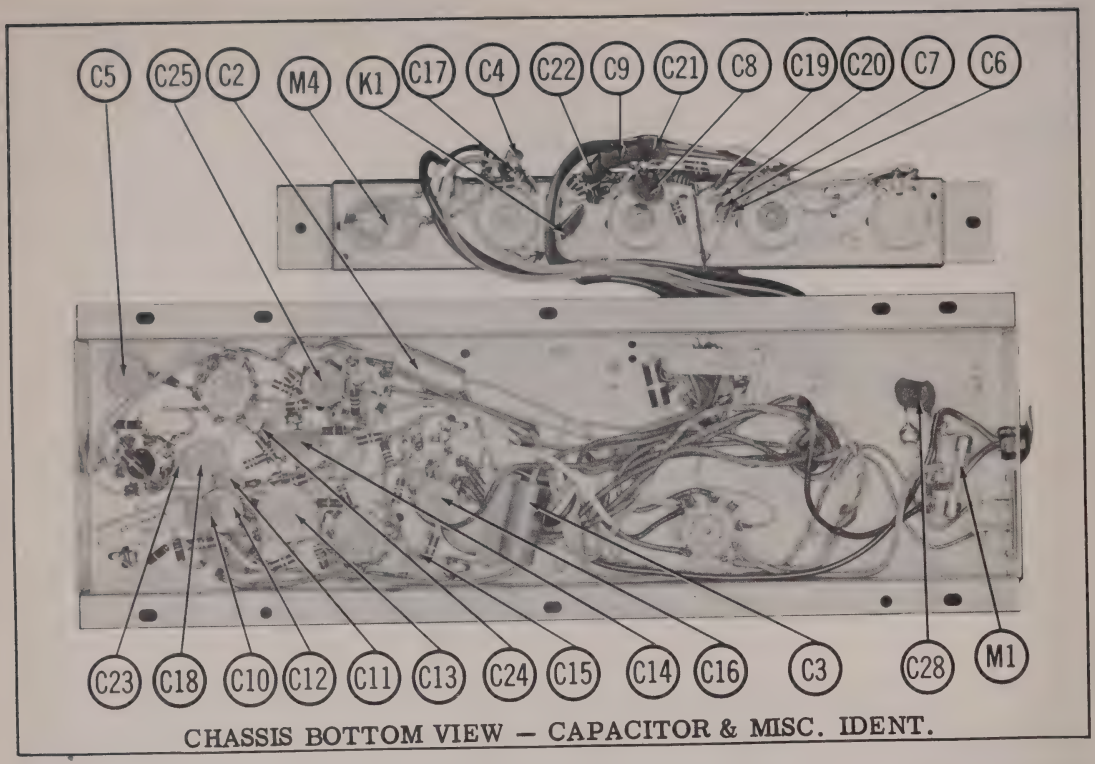
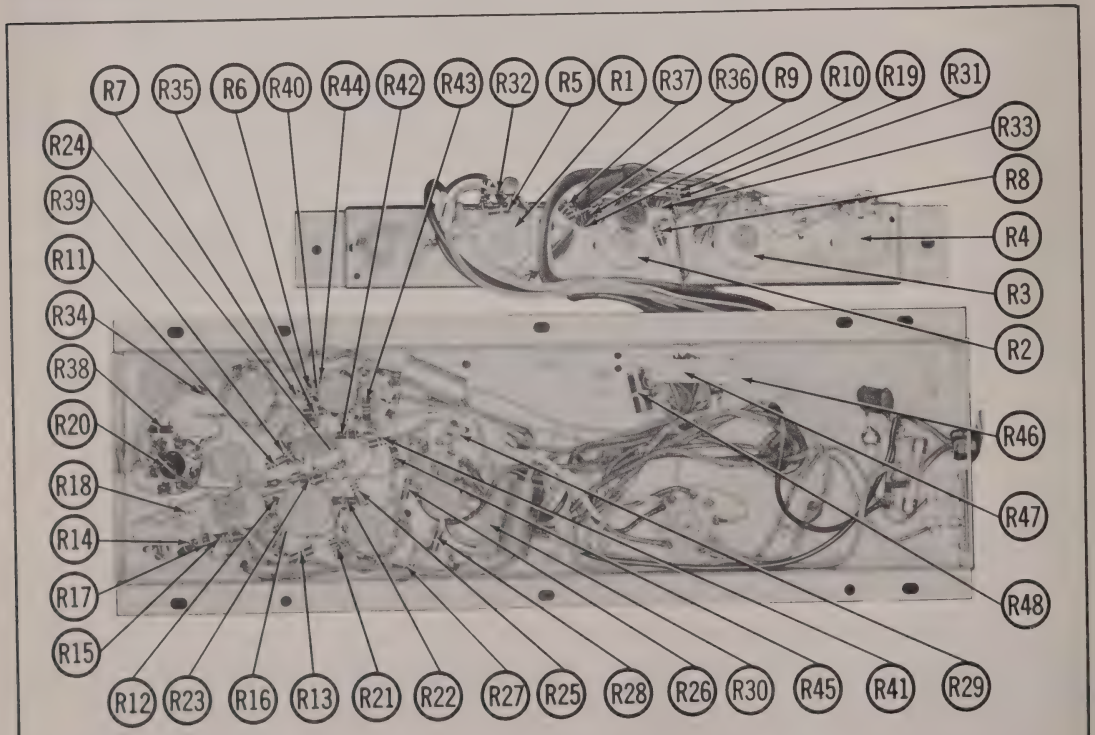
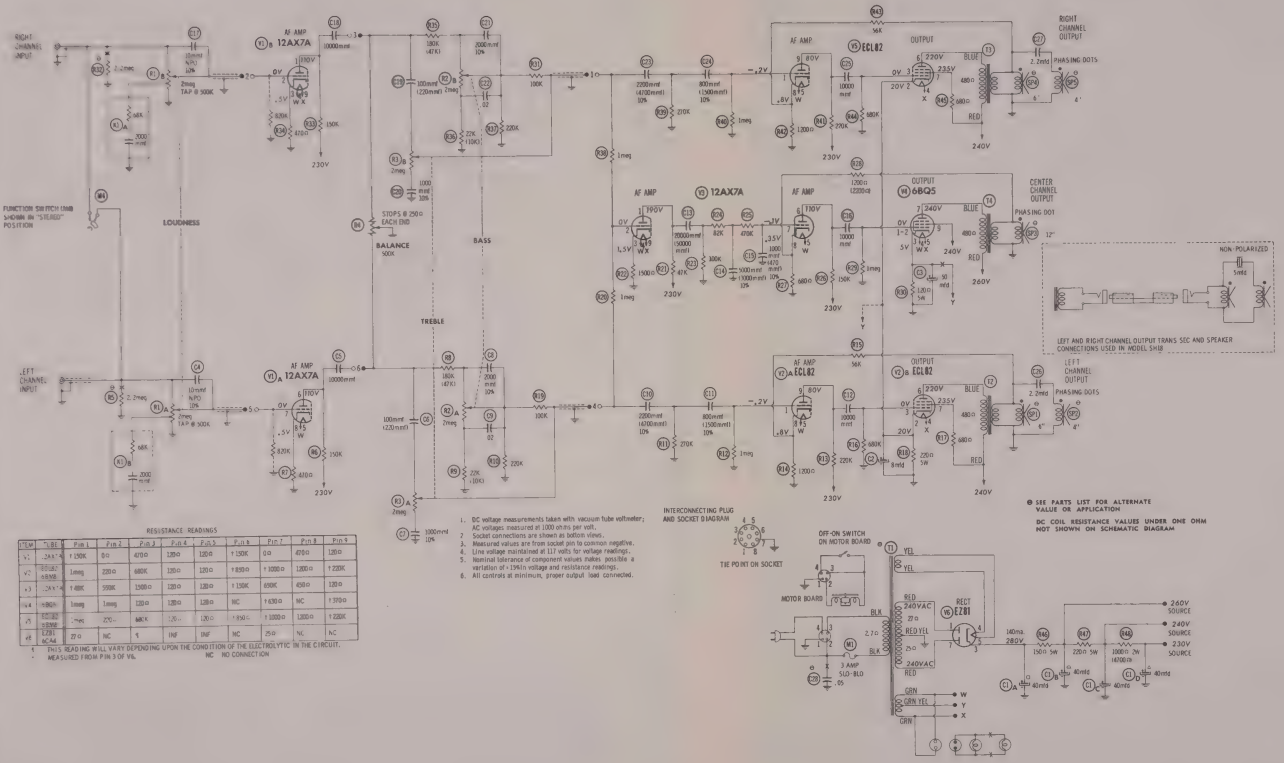
SET 493 FOLDER 11



CHASSIS BOTTOM VIEW – CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW – RESISTOR IDENT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊘ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7-A	1 150K	0Ω	470Ω	120Ω	120Ω	1 150K	0Ω	470Ω	120Ω
V2	12AX7-B	1meg	220Ω	680K	120Ω	120Ω	1 850Ω	1 100Ω	1200Ω	1 220K
V3	12AX7-A	1 68K	598K	1500Ω	120Ω	120Ω	1 150K	690K	450Ω	120Ω
V4	6BQ5	1meg	1meg	120Ω	120Ω	120Ω	NC	1 630Ω	NC	1 370Ω
V5	ECL82-A	1meg	220Ω	680K	120Ω	120Ω	1 850Ω	1 100Ω	1200Ω	1 220K
V6	EZ81	27Ω	NC	¶	INF	INF	NC	25Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. MEASURED FROM PIN 3 OF V6.

NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOTOROLA MODELS SH18GL, N, SK24B, M, W (Ch. HS-765, HS-780)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amplifier Right Channel AF Amp.	12AX7A
V2	Left Channel AF Amplifier Left Channel Output	ECL82/6BM8
V3	Center Channel AF Amp.	12AX7A
V4	Center Channel Output	6BQ5
V5	Right Channel AF Amp. - Right Channel Output	ECL82/6BM8
V6	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	350	23K642239	AFH4-04-50	D0034	FP420.38	TMQ-120	TVL-4635.3	
B	▬40	350							
C	40	350							
D	▲40	350							
C2	8	25	23K645315	PRS1405	BBR8-150	TT25X8	TC-8-150	TVA-1405	
C3	50	10	23B636685	XPP-100-50	BBR50-25	TT10X50	TD-50-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C5	10000		BPD-01	DD-103	BYA10D1	CCD-103	GP110	5HK-S10
C6	100	(220) †	BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C8	2000 10%		DI-2000		1R5D2	CCD-202	GP220	10TS-D20
C9	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S20
C10	2200 10%	(4700) †	DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C11	800	(1500) †	DI-820	DD-801	1R5T8	CCD-801	GP382	10TS-T80
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	20000	(50000) †	BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C14	5000 10%	(3000) †	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C15	1000 10%	(470) †	DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C17	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	100	(220) †	BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C20	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C21	2000 10%		DI-2000		1R5D2	CCD-202	GP220	10TS-D20
C22	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C23	2200 10%	(4700) †	DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C24	800 10%	(1500) †	DI-820	DD-801	1R5T8	CCD-801	GP382	10TS-T80
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C26	2.2mfd 3V			UK-105				HY150
C27	2.2mfd 3V			UK-105				HY150
C28	.05 400V	Note 1	P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

† Alternate Values used in Chassis HS-765.
Note 1. Chassis HS-780 only.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg 500K Tap	½	18K644211					Loudness, Right Channel
B	2meg 500K Tap	½						Loudness, Left Channel
R2A	2meg	½	18A642217	B-76	AD47-2meg-Z		FA26A	Bass, Right Channel
B	2meg	½		SR-76	Not Req.		RU26A	Bass, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	
R3A	2meg	½	18A642217	B-76	AD47-2meg-Z		FA26A	Treble, Right Channel
B	2meg	½		SR-76	Not Req.		RU26A	Treble, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	
R4	500K *	½	18K645738					Balance

* Stops at 250Ω each end.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	2.2meg	
R6	150K	
R7	470Ω	
R8	180K	(47K) *
R9	22K	(10K) *
R10	220K	
R11	270K	
R12	1meg	
R13	220K	
R14	1200Ω	
R15	56K	
R16	680K	
R17	680Ω	
R18	220Ω 5W	
R19	100K	

ITEM No.	RATING	REMARKS
R20	1meg	
R21	47K	
R22	1500Ω	
R23	100K	
R24	82K	
R25	470K	
R26	150K	
R27	680Ω	
R28	1200Ω	(2200Ω) *
R29	1meg	
R30	120Ω 5W	
R31	100K	
R32	2.2meg	
R33	150K	
R34	470Ω	

ITEM No.	RATING	REMARKS
R35	180K	(47K) *
R36	22K	(10K) *
R37	220K	
R38	1meg	
R39	270K	
R40	1meg	
R41	220K	
R42	1200Ω	
R43	56K	
R44	680K	
R45	680Ω	
R46	150Ω 5W	#17K636326
R47	220Ω 5W	#17K632247
R48	1000Ω 2W	(4700Ω) †

* Chassis HS-765. † Alternate Value. # Motorola Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Loudness Comp.	(2) 2000mmf, (2) 68K	51B644164	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .74A	480 VCT Ⓐ .140A	6.3V Ⓐ .9A	25C645587-0①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT Ⓐ 2.9A									

① Alternate Part #25C645587.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5400Ω	6-8Ω	25C645449F①	24S05	A-2903	AU-608	A-3850	24S05	S-53X③	
T3	5400Ω	6-8Ω	25C645449F①	24S05	A-2903	AU-608	A-3850	24S05	S-53X③	
T4	6000Ω	6-8Ω	25C645446A②	22S88	A-2902③	AU-604	A-3849	22S88		

① Alternate Part #25C645449. ② Alternate Part #25C645446. ③ Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"	PM	6-8Ω	50D645584 *	6A31Z8.2	* Models SK24M, B, W
SP2	4"	PM	14-16Ω	50D645756 *	4A1Z15.6	‡ Models SH18GL, N
SP3	12"	PM	6-8Ω	50K645547 *	12A6AZ8.6	
SP4	6"	PM	6-8Ω	50D645584 *	6A31Z8.2	
SP5	4"	PM	14-16Ω	50D645756 *	4A1Z15.6	
	6"x 9"	PM	6-8Ω	50D644987 ‡		
	5 1/4"	PM	6-8Ω	50C644990 ‡		
	5 1/4"	PM	6-8Ω	50C644990 ‡		
	4"	PM	8-10Ω	50C636446 ‡	4A1TZ9	
	4"	PM	8-10Ω	50C636446 ‡	4A1TZ9	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 125V S/B P/T	65A646112		315003 (3A 125V S/B P/T)		MDV3	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	MOTOROLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	59K645704	13TB		26S		53	J-43 & J-47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS	
	MOTOROLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M3	47K645702 ♦† or 47K645703 †	W-103STSS † or W-103STDS ♦†	S-71X † or S-71XSD †♦ or S-71XDD ♦	† Jewel	♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B642153	Stereo-Monaural (Rotary Wafer)

CABINETS & CABINET PARTS

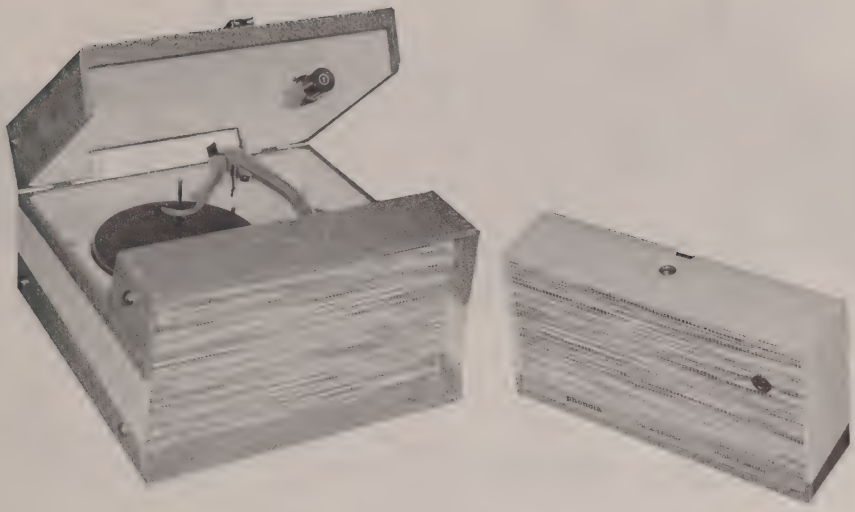
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K644336	Loudness, Model SH18GL, N
Knob	36K644308	Loudness, Model SK24B, M, W
Knob	36K644337	Bass & Treble, Models SH18GL, N
Knob	36K644309	Bass & Treble, Model SK24B, M, W
Knob	36D644335	Function, Model SH18GL, N
Knob	36K644310	Function, Model SK24B, M, W
Knob	36K644338	Balance, Model SH18GL, N
Knob	36D644280	Balance, Model SK24B, M, W
Cabinet	16E645560	Model SH18GL
Cabinet	16K645710	Model SH18N
Cabinet	16K644023	Model SK24B
Cabinet	16E644022	Model SK24M
Cabinet	16K644024	Model SK24W
Cabinet Leg	16K644192	Model SK24B
Cabinet Leg	16K644031	Model SK24M
Cabinet Leg	16K644030	Model SK24W
Cabinet Lid	16K644028	Model SK24B
Cabinet Lid	16K644027	Model SK24M
Cabinet Lid	16K644029	Model SK24W
Handle	55K645576	Model SH18GL
Handle	55K645725	Model SH18N

PHOTOFACT® Folder

**PHONOLA
MODEL 3259**

PHONOLA
MODEL 3259



PHONOLA
MODEL 3259

TRADE NAME	Phonola Model 3259
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minnesota
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 61 Watts, .6 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13802 — SEE V-M 1201 — PHOTOFACT SET 436
FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 493 FOLDER 12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT832

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V3	Channel 2 Output	6AQ5A
V2	Channel 1 Output	6AQ5A	V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	400	13535	AFH4-79	D0663	FP431.2	TMT-133 TD-20-150	TVL-4737	
B	■40	400							
C	▲20	25							
D	20	25							
C2	4	10NP	12961	NP-PRS7405	BBR4-150	TCN504		TVANS-1150 *	
C3	4	10NP	12961	NP-PRS7405	BBR4-150	TCN504		TVANS-1150 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10	
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4047	4TM-S47	
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C7	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C8	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10	
C9	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47	
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C11	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K *		13801	BT-159				Loudness, Channel 1
B	500K *			STR-159				Loudness, Channel 2
R2A	500K		13800	B-60	AD47-500K-2		FB55A	Treble, Channel 1
B	500K			SR-60	Not Req.		RU55A	Treble, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	2meg		13228	B-76	AD47-2meg-2		FA26A	Bass, Channel 1
B	2meg			SR-76	Not Req.		RU26A	Bass, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	1meg		13501	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Taps @ 80K and 160K.

RESISTORS

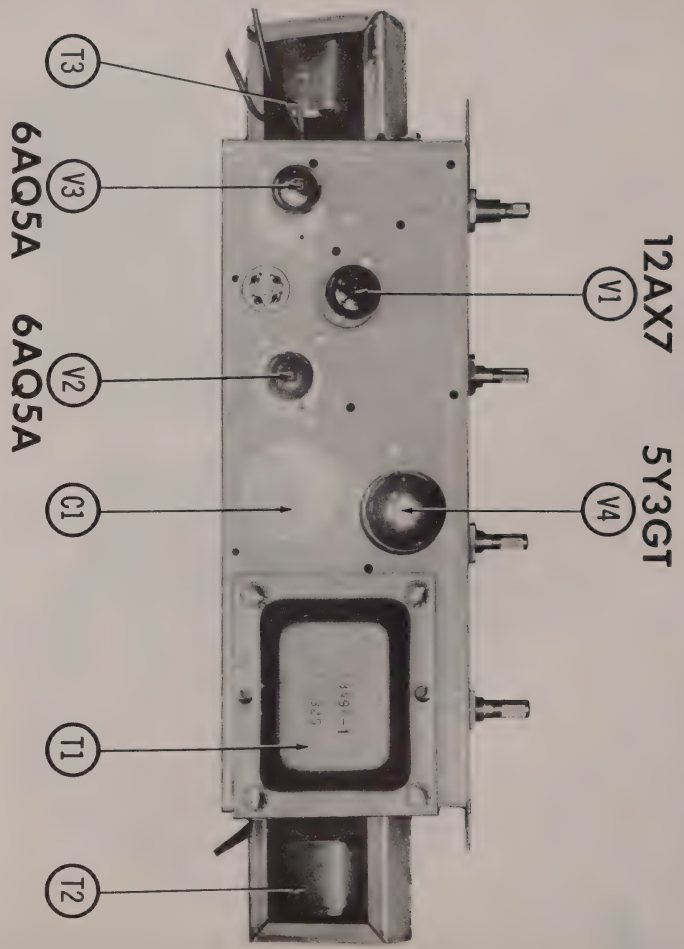
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	150K	
R6	220K	
R7	1500Ω	
R8	22K	
R9	8200Ω	

ITEM No.	RATING	REMARKS
R10	47K	
R11	150Ω 2W	
R12	1.5meg	
R13	150K	
R14	220K	

ITEM No.	RATING	REMARKS
R15	22K	
R16	8200Ω	
R17	47K	
R18	100Ω 1W	
R19	2700Ω 1W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .6A	540 VCT Ⓐ .085A	5V Ⓐ 2A	13496-1 ①				PM-8404		R-10B
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT Ⓐ 1.2A									

① Alternate Part #13496.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7800Ω	3-4Ω	13808-B①	26S48	A-3020②	AU-606	A-3824	26S48	S-9X	
T3	7800Ω	3-4Ω	13808-B①	26S48	A-3020②	AU-606	A-3824	26S48	S-9X	

① Alternate Part #13808.
② Drill New Mounting Holes.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	12963	6A21	
SP2	3½"	PM	6-8Ω	12908	3A15TZ7	
SP3	6"	PM	3-4Ω	12963	6A21	
SP4	3½"	PM	6-8Ω	12908	3A15TZ7	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	PHONOLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	WC13376 (Includes M2)	13TB		26S	S1-1 S3-3	53	J3 & J47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	WC13377 †	W-103STSS † or W-103STDS †♦ or W-103STDD ♦	S-71X † or S-71XSD †♦ or S-71XDD ♦	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

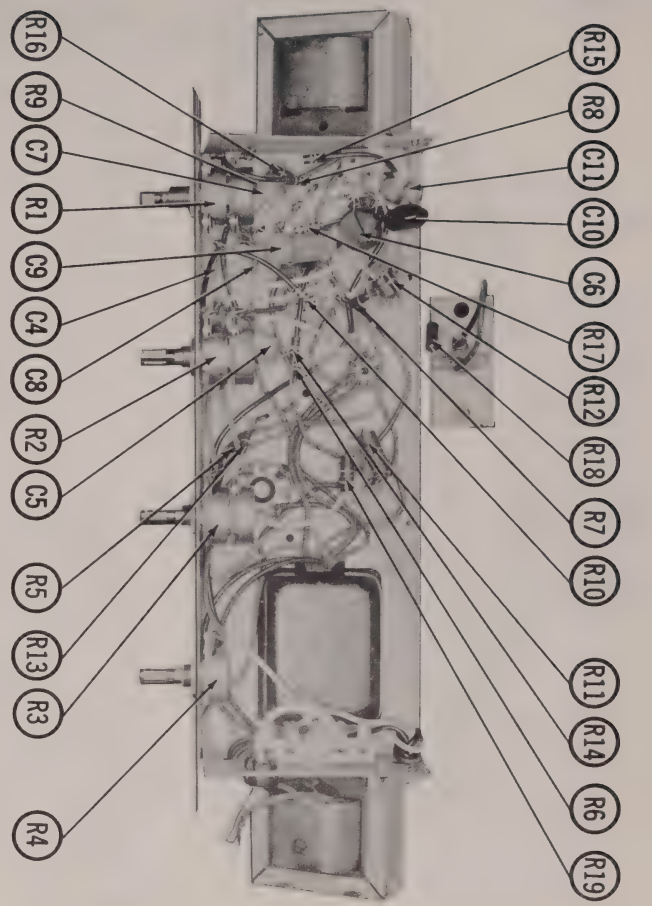
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

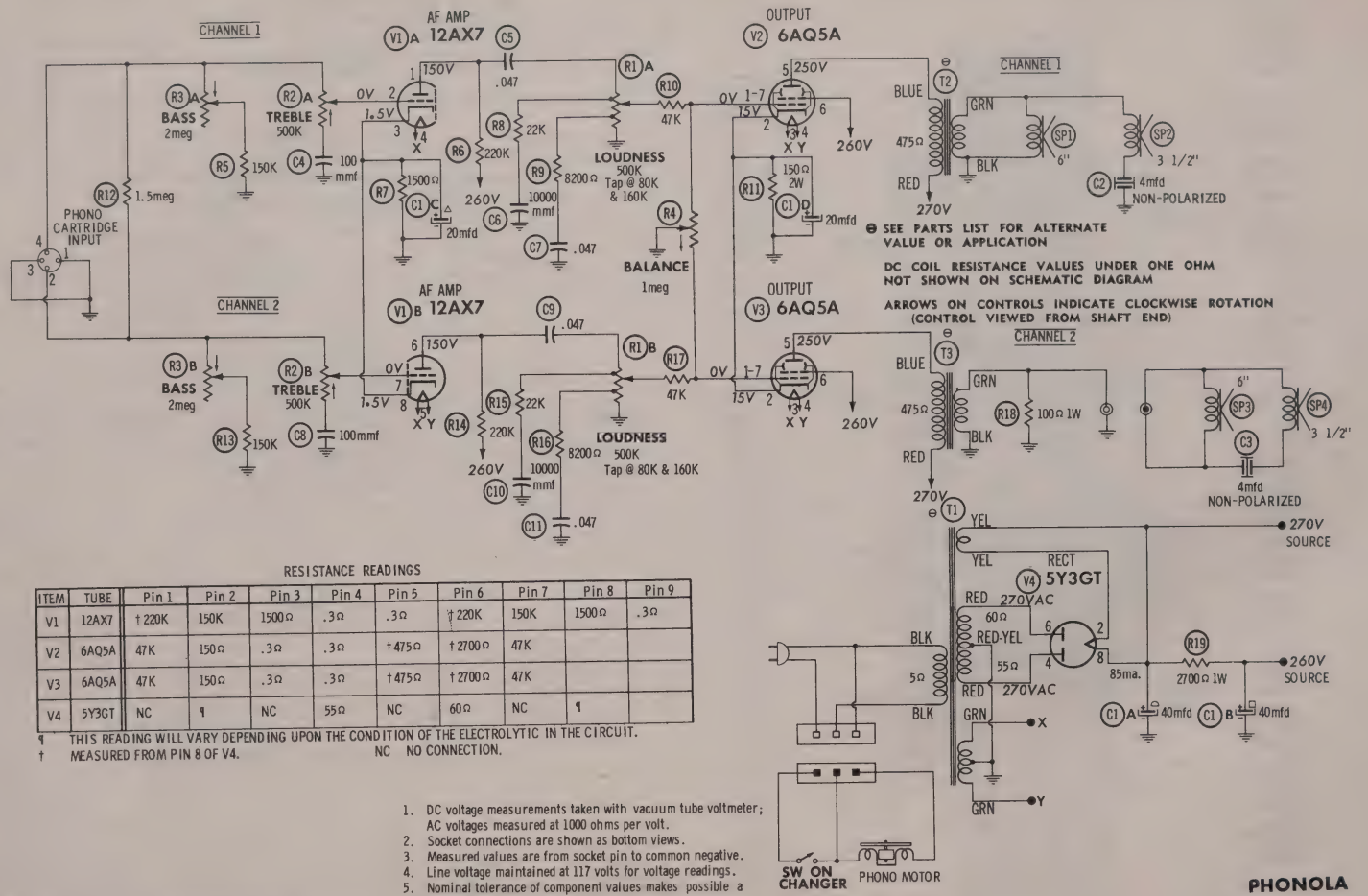
NAME	PART NO.	DESCRIPTION
Knob	13440-8E	Volume, Tone, Balance
Cabinet Assembly	13674	
Handle	13495-6B	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†220K	150K	1500Ω	.3Ω	.3Ω	†220K	150K	1500Ω	.3Ω
V2	6AQ5A	47K	150Ω	.3Ω	.3Ω	†475Ω	†2700Ω	47K		
V3	6AQ5A	47K	150Ω	.3Ω	.3Ω	†475Ω	†2700Ω	47K		
V4	5Y3GT	NC	¶	NC	55Ω	NC	60Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4. NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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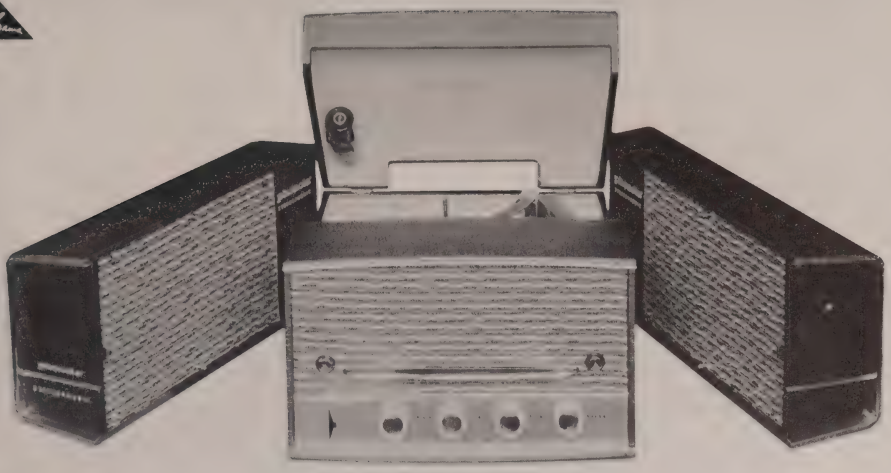
PHONOLA MODEL 3259

PHOTOFACT® Folder

**PHONOLA
MODEL 3359**

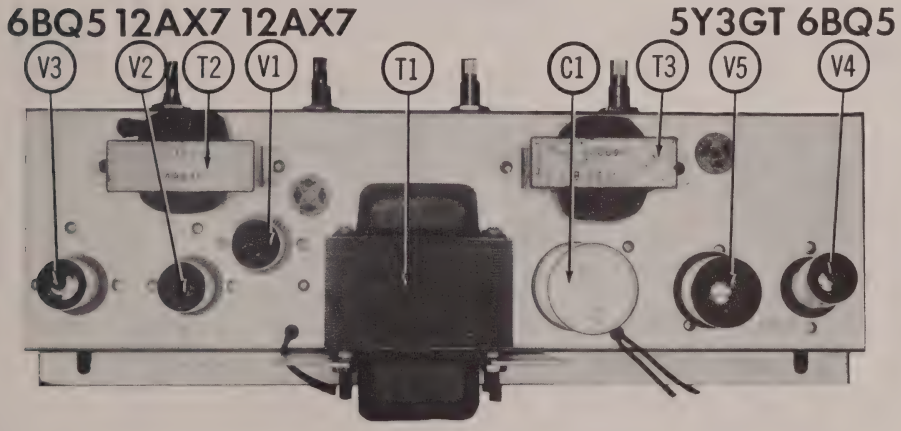
PHONOLA
MODEL 3359



PHONOLA
MODEL 3359

TRADE NAME	Phonola Model 3359
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minnesota
TYPE SET	AC Operated 5 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 71 Watts, .68 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13869 — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT833

SET 493 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V3	Channel 1 Output	6BQ5
V2	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V4	Channel 2 Output	6BQ5
			V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▬40	400	13751	AFH4-18-45	D0177	FP447.5	TMQ-120	TVL-4775	
B	■40	400							
C	▲40	400							
D	40	400							
C2	25	15	13847	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	
C3	4	10NP	12961	NP-PRS7405	BBR4-150	TCN504		TVANS-1150*	
C4	4	10NP	12961	NP-PRS7405	BBR4-150	TCN504		TVANS-1150*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

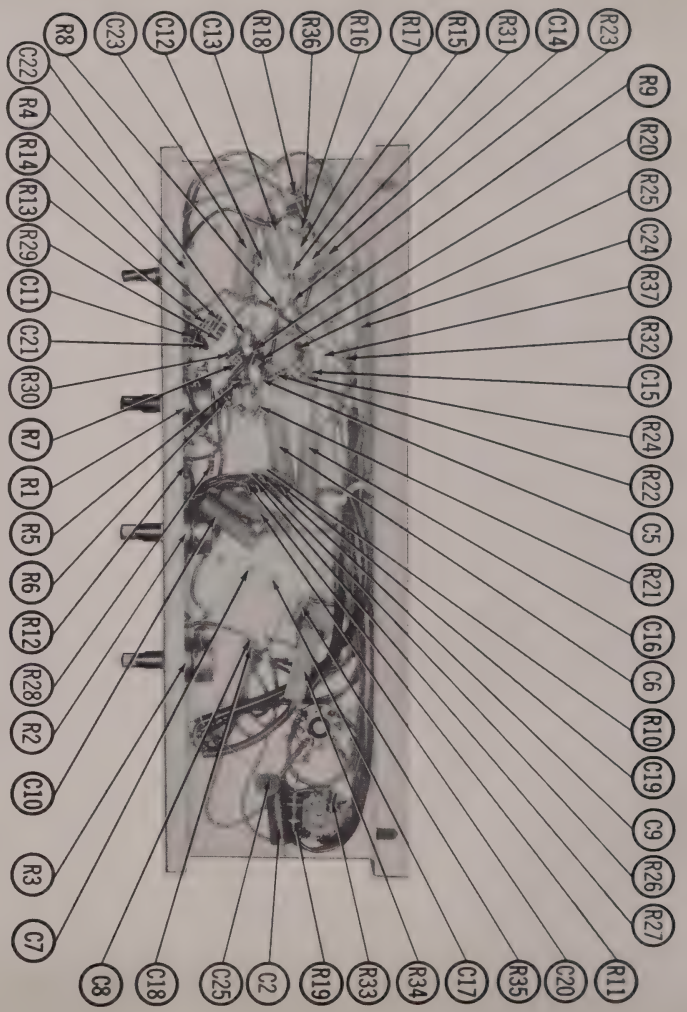
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	47		BPD-000047	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C6	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C8	2200		BPD-0022	DD-222	BYA10D2	CCD-222	B-222	5HK-D22
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C11	47		BPD-000047	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C14	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C15	47		BPD-000047	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C18	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C21	47		BPD-000047	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C24	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K *	½	13801	BT-159				Loudness, Channel 1
B	500K *			STR-159				Loudness, Channel 2
R2A	2meg	½	13898	B-76				Bass, Channel 1
B	2meg			SR-76				Bass, Channel 2
C	Bushing			AK-31				
R3A	2meg	½	13898	B-76				Treble, Channel 1
B	2meg			SR-76				Treble, Channel 2
C	Bushing			AK-31				
R4A	1meg	½	13501	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Taps @ 80K and 160K.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	2.2meg	
R6	5.6meg	
R7	470K	
R8	100K	
R9	1500Ω	
R10	27K	
R11	10K	
R12	47K	
R13	82K	
R14	8200Ω	
R15	100K	(220K) *
R16	2200Ω	(1500Ω) *
R17	27K	
R18	1meg	
R19	68Ω 2W	
R20	5.6meg	
R21	5.6meg	
R22	470K	
R23	100K	
R24	1500Ω	
R25	5.6meg	
R26	27K	
R27	10K	
R28	47K	
R29	82K	
R30	8200Ω	
R31	100K	(220K) *
R32	2200Ω	(1500Ω) *
R33	1meg	
R34	180Ω 7W	
R35	1200Ω 1W	
R36	4700Ω 1W	
R37	27K	

* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .68A	550 VCT @.090A	5V@ 2A	13726-C①	24R20 ②			PM-8404	24R20②	R-10B
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @ 1.5A									

① Alternate Part #13726.
② Drill New Mounting Hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω	6-8Ω	13731-B①	22S88	A-2902②	AU-606	A-2313	22S88	S-53X②	
T3	7000Ω	6-8Ω	13731-B①	22S88	A-2902②	AU-606	A-2313	22S88	S-53X②	

① Alternate Part #13731.
② Drill New Mounting Hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω	13856	8A21Z6.4	
SP2	4"	PM	6-8Ω	13857	4A21Z6.4	
SP3	8"	PM	6-8Ω	13856	8A21Z6.4	
SP4	4"	PM	6-8Ω	13857	4A21Z6.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	PHONOLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	W.C. 13939 (Includes M2)	13TB		26S	S1-1 S3-3	53	J-43, J-47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	W.C. 13940 (78 RPM)	W-101STS † or W-101STD ♦	E98 † or E98D ♦	† Jewel ♦ Diamond
	W.C. 13941 (LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

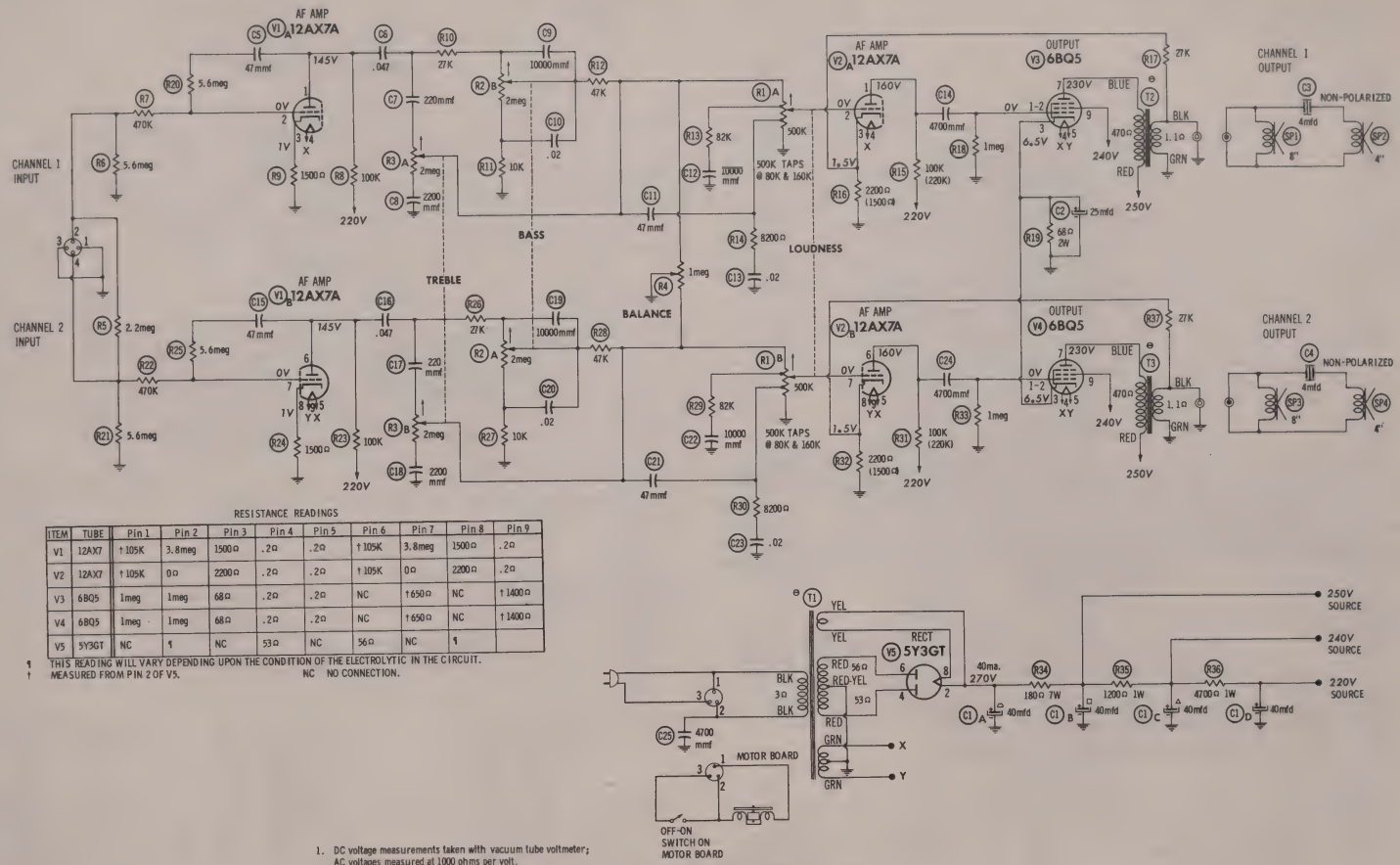
NAME	PART NO.	DESCRIPTION
Knob	13440-8E	Treble, Bass, Loudness, Balance
Case Assembly	13891	
Handle	13682-C	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FOLDER 13

PHONOLA
MODEL 3359



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†105K	3.8meg	1500Ω	.2Ω	.2Ω	†105K	3.8meg	1500Ω	.2Ω
V2	12AX7	†105K	0Ω	2200Ω	.2Ω	.2Ω	†105K	0Ω	2200Ω	.2Ω
V3	6BQ5	1meg	1meg	68Ω	.2Ω	.2Ω	NC	†650Ω	NC	†1400Ω
V4	6BQ5	1meg	1meg	68Ω	.2Ω	.2Ω	NC	†650Ω	NC	†1400Ω
V5	5Y3GT	NC	¶	NC	53Ω	NC	56Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V5. NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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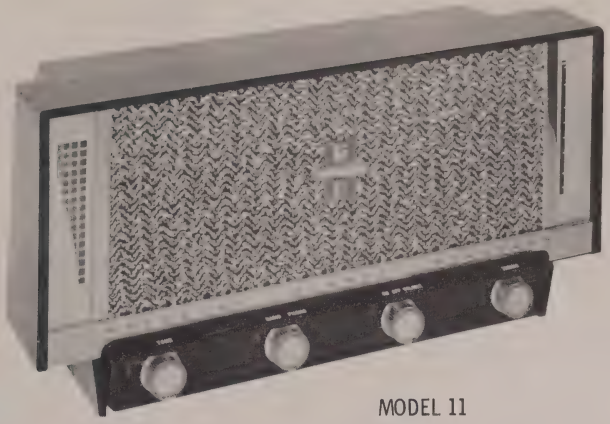
PHONOLA MODEL 3359

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE MODELS 11, 12, 13 (Ch. 132.44501)

SILVERTONE MODELS 11, 12, 13 (Ch. 132.44501)



MODEL 11

TRADE NAME	Silvertone Models 11, 12, 13 (Ch. 132. 44501)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC-DC Operated 6 Tube AM Receiver
POWER SUPPLY	110-120 Volts AC-DC RATING 31 Watts, .32 Amp @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1670KC

ALIGNMENT INSTRUCTIONS

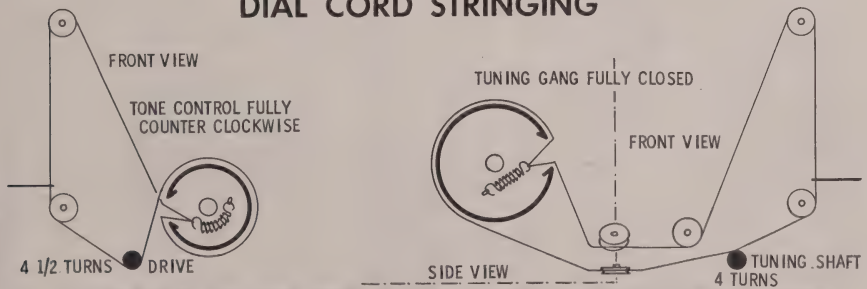
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A8, A9.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	High side thru .05mfd to pin 7 (grid) of converter. Low side to chassis.	455KC (400~ mod.)	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2	Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3	"	1400KC	Tune to 1400KC signal.	"	A6, A7	Adjust for maximum output.
4	"	600KC	Tune to 600KC signal.	"	A8, A9	Adjust for maximum output while rocking tuning gang.

DIAL CORD STRINGING



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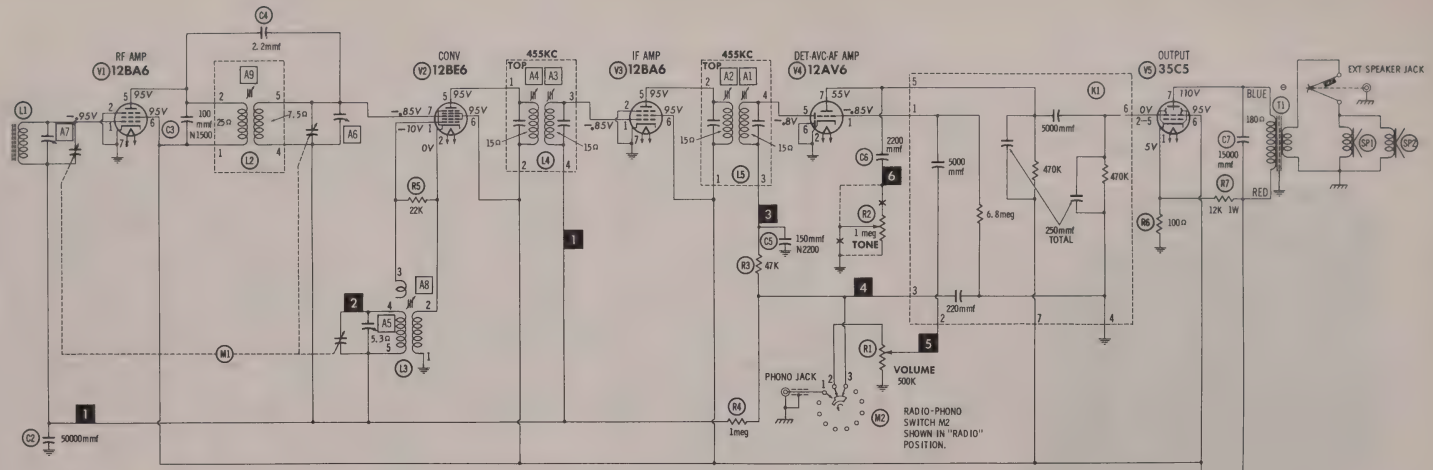
JG749

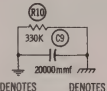
SET493 FOLDER 14



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TERMINAL VIEW L4 AND L5

TERMINAL VIEW L2

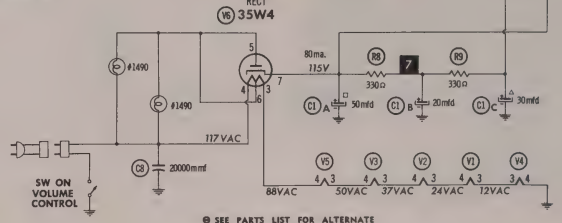


DENOTES B−

DENOTES CHASSIS

TERMINAL VIEW L3

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	1.5meg	0Ω	12Ω	24Ω	†685Ω	†660Ω	0Ω
V2	12BE6	22K	.5Ω	24Ω	36Ω	†675Ω	†660Ω	1.5meg
V3	12BA6	1.5meg	0Ω	36Ω	48Ω	†675Ω	†660Ω	0Ω
V4	12AV6	6.8meg	0Ω	12Ω	0Ω	550K	0Ω	†470K
V5	35C5	100Ω	470K	48Ω	83Ω	470K	†660Ω	†180Ω
V6	35W4	NC	NC	83Ω	118Ω	110Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

©Howard W. Sams & Co., Inc. 1960

SILVERTONE MODELS 11, 12, 13 (Ch. 132.44501)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	RF Amplifier	12BA6
V2	Converter	12BE6
V3	IF Amplifier	12BA6
V4	DET - AVC - AF Amp	12AV6
V5	Output	35C5
V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	43711-3	PWH3-11-30	+ C0080	PFP311. 63		PCL-3440. 5	
B	20	150							
C	▲30	150							

+ Use Printed Circuit Adapters #55277 & 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	50000			BPD-05	DD-503	CUB2S5	CCD-503	GP150	5HK-S50
C3	100	N1500	#43957-1		TCL-100		*		
C4	2. 2			NPO-S12. 2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-533	10TCC-V22
C5	150	N2200	#43957-2				*		30TCY-T15
C6	2200			BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C7	15000			BPD-015	DD-153	BYA10S15	CCD-153	GP150	5HK-S15
C8	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C9	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20

Silvertone Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	44500-10		C47S-500K-Z	B13-133	PP55A	Volume
B	Switch				Not Req.	SK7	Not Req.	Push-Pull Off-On
R2A	1meg	1/2	44500-11	B-68		QI7-137	RU16R	Tone
B	Bushing			Not Req.		Not Req.	SL38	
C	Shaft			Not Req.		Not Req.	SL3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	47K	
R4	1meg	
R5	22K	

ITEM No.	RATING	REMARKS
R6	100Ω	
R7	12K 1W	
R8	330Ω	

ITEM No.	RATING	REMARKS
R9	330Ω	
R10	330K	

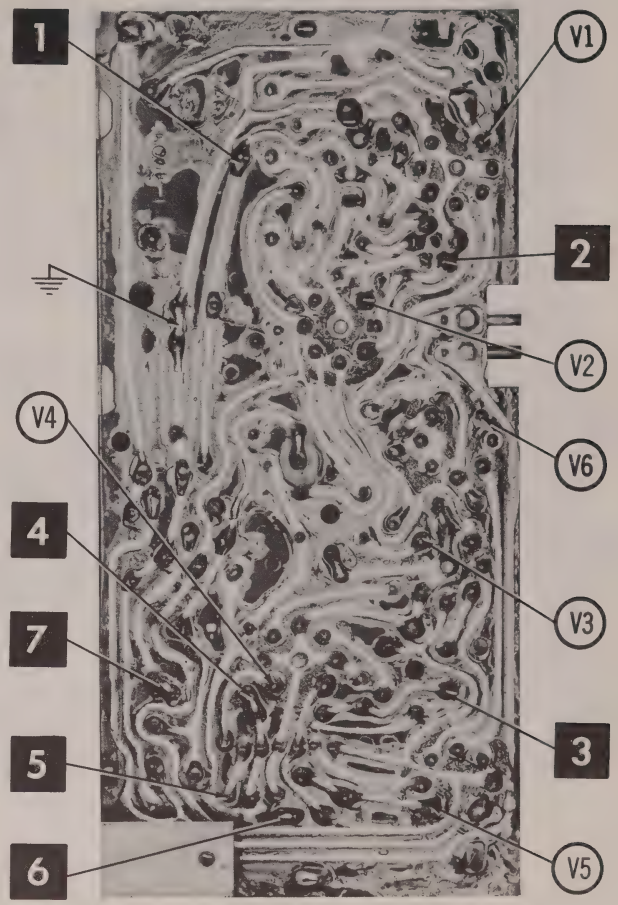
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovox Centralab Sprague	PA-512-3 PC-158 DT-5

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	45534-8			BC-419			
L2	RF Coil	43829-1						
L3	Osc Coil	43644-3						
L4	Input IF Trans	44282-1	16-6780	16-6780	BC-356	13-PC9	RF-4	
L5	Output IF Trans	44282-1	16-6780	16-6780	BC-357	13-PC10	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	42700-13 ①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

① Alternate Part #42700-21

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	6-8Ω	43365-2	5AIZ6	
SP2	5"	PM	6-8Ω	45599-7	5AIZ6.1	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap	46101-1	3 Gang
M2	Switch	46069-1	Radio - Phono
	Printed Board	46006-1	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

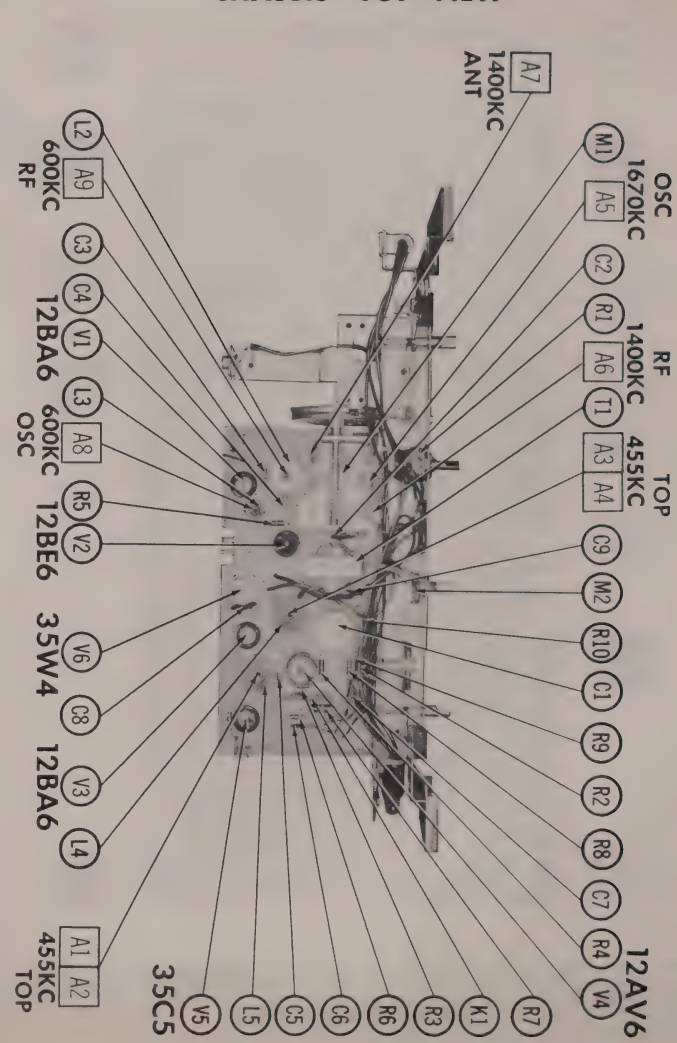
NAME	PART NO.	DESCRIPTION
Knob	47197-1	Tuning, Volume, Switch
Dial Pointer	47623-1	
Tone Pointer	47624-1	
AM Dial Glass	47498	
Tone Dial Glass	47497	
Cabinet Front	47491-48	Model 11
Cabinet Front	47491-107	Model 12
Cabinet Front	47491-95	Model 13
Cabinet Back	47476-48	Model 11
Cabinet Back	47476-107	Model 12
Cabinet Back	47476-95	Model 13

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8674

CHASSIS—TOP VIEW



PHOTOFACT® Folder

SILVERTONE MODELS 277, 278, 279 (Ch. 528.59690)

SILVERTONE MODELS 277, 278, 279 (Ch. 528.59690)

MODEL 277

SILVERTONE MODELS 277, 278, 279 (Ch. 528.59690)

TRADE NAME	Silvertone Models 277, 278, 279 (Ch. 528. 59690)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-125 Volts AC, 60 Cycles RATING 30 Watts, . 32 Amp @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER 528. 56702 or 528. 56703 - SEE SIMILAR SILVERTONE 528. 56310 - PHOTOFACT SET 417 FOLDER 10.

SET 493 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT873

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp - Channel 2 AF Amp	12AX7	V2 V3	Channel 1 Output Channel 2 Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲150	150	18-60-3		DO310	FP420.54		TVL-3449	
B	■ 50	150			BBR25-25	TC492		TVA-1205	
C	▲ 25	25							
D	25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000	1000V		BPD-02		CUBI0S2	16DP-4-203	GEM-1012	5HK-S20
C3	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473		4TM-S47
C4A	5000			BPD-2X0047	DD3-502	BYD6DD5	CCD-502	B2X250	5HK-2D47
B	5000						CCD-502		
C5	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C6	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C7	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C8	330			BPD-00033	DD-331	L10T33	CCD-331	GP330	10TS-T33
C9	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C10	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C11	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C12	330			BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C13	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	24-332-0					Volume, Channel 1
B	2meg	½						Volume, Channel 2
R2A	1meg	½	24-211-2	AB-70	AD-47-1meg-Z		FB16A	Treble, Channel 1
B	1meg	½		SR-70	Not Req		RU16A	Treble, Channel 2
C	Shaft			AK-8	RS-3/16		CS687 & DS-37	
R3A	5meg	½	24-212-2				FD56R	Bass, Channel 1
B	5meg	½					RU56R	Bass, Channel 2
C	Shaft						CS687 &DS-37	

RESISTORS

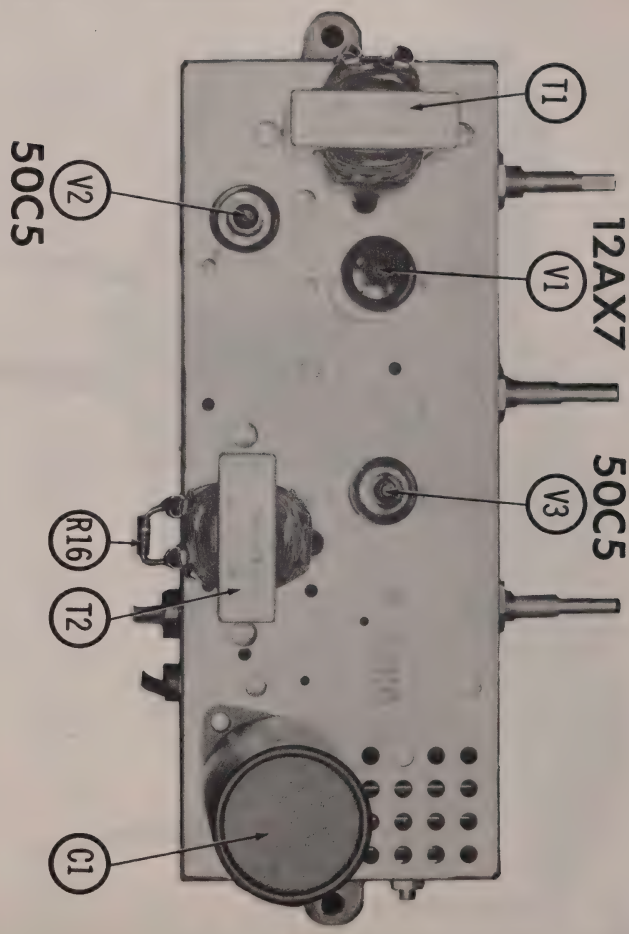
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	4.7meg	
R6	270K	
R7	470K	
R8	100Ω	
R9	120Ω	

ITEM No.	RATING	REMARKS
R10	100K	
R11	4.7meg	
R12	270K	
R13	470K	
R14	100Ω	
R15	120Ω	

ITEM No.	RATING	REMARKS
R16	220Ω	
R17	2200Ω 1W	
R18	27Ω 2W	
R19	53Ω 2W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	6-8Ω	B80-78-1D ①	22S46	A-2902②	AU-600 ②	A-3849②	22S46	S-53X②	
T2	2400Ω	6-8Ω	B80-78-1D ①							

① Alternate Part #80-78-1 ② Drill new mounting hole

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"x9"	PM	8-10Ω	33-394-4 *	69A1Z9.3	*Left Channel
SP2	6"x9"	PM	8-10Ω	33-394-4 ♦	69A1Z9.3	♦Right Channel

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.085	* 86-15-3	RS150 *	1235AH *	150 *	♦SR200	*Selenium Type ♦Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	33-311-0	13TB	Not Req.	26S	S1-3 S1-1			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	83-1252 † (5716) (LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	† Jewel ♦ Diamond
	83-1250 † (5715) (78RPM)	W-101STS † or W-101STD ♦	E98 † or E98D ♦	

MISCELLANEOUS

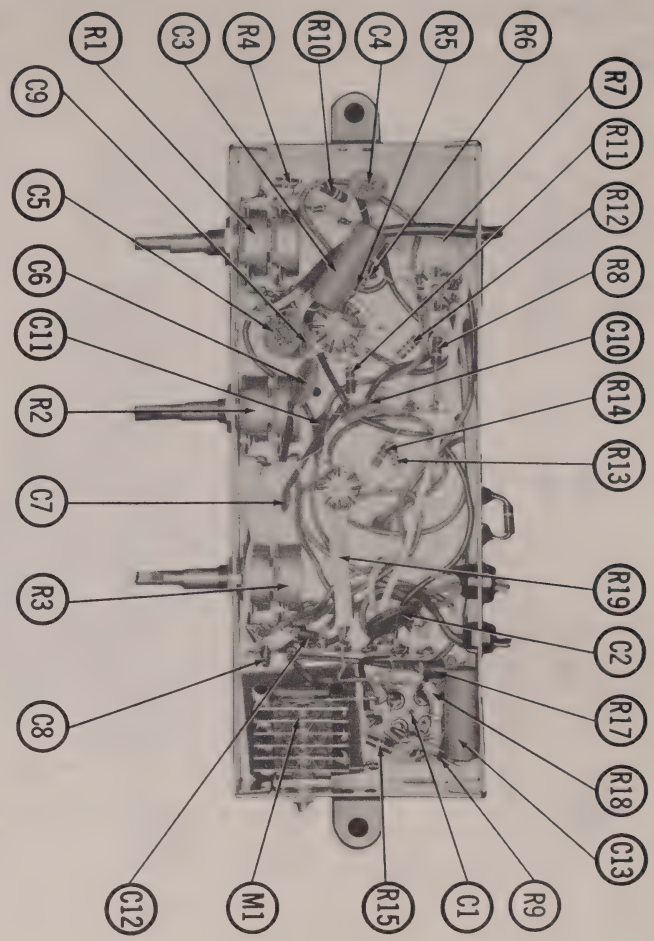
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Switch	69-282-0	Stereo - Monaural (SPDT Slide Type) (Part of Changer)
M5	Switch	69-279-0	Reject (SPDT Slide Type) (Part of Changer)
M6	Switch	84-7638	Off-On (Part of Changer)
M7	Solenoid	27-71-2	Reject
M8	Motor	59-72	Turntable Drive (Complete) Chassis 528.56702
	Motor	59-89	Turntable Drive (Complete) Chassis 528.56703

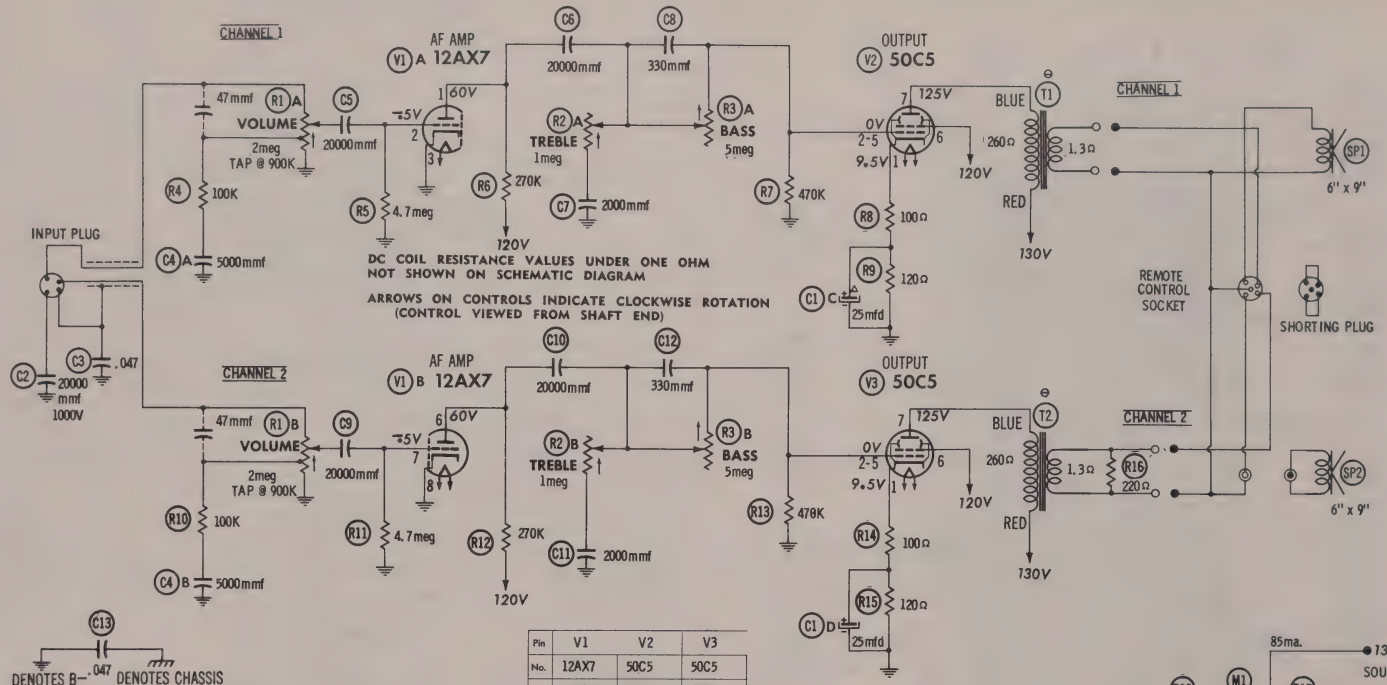
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1266-0	Volume (Main)
Knob	52-1240-0	Volume (Stereo)
Knob	52-1237-0	Power On-Off
Knob	52-1238-0	Speed Control
Knob	52-1318-0	Bass, Treble
Button	52-1123-0	Reject
Cabinet	42-112-2	Model 277
Cabinet	42-113-2	Model 278
Cabinet	42-114-2	Model 279
Cabinet	42-47-4	External Speaker Enclosure, Model 277
Cabinet	42-48-4	External Speaker Enclosure, Model 278
Cabinet	42-49-4	External Speaker Enclosure, Model 279

CHASSIS—BOTTOM VIEW





Pin No.	V1 12AX7	V2 50C5	V3 50C5
1	†270K	220Ω	220Ω
2	4.7meg	470K	470K
3	0Ω	12Ω	62Ω
4	0Ω	62Ω	112Ω
5	12Ω	470K	470K
6	†270K	†2200Ω	†2200Ω
7	4.7meg	†260Ω	†260Ω
8	0Ω		
9	6Ω		

† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODELS 277, 278, 279 (Ch. 528.59690)

PHOTOFACT® Folder

STUZZI MODEL
671-B

STUZZI MODEL
671-B

STUZZI MODEL
671-B

GENERAL INFORMATION

The Stuzzi "Magnette" 671-B is a two speed battery-operated tape recorder.

The Model 671-B is designed to record and play two tracks of material on standard-width recording tape. This doubles the recording and playing time. Recordings can be made from a phonograph, radio, or television receiver in addition to those made directly from the microphone.

Tape speeds of 1-7/8" and 3-3/4" per second are used. Using both tracks, the recording time on a 4" reel of long play tape, at 3-3/4 ips, is 46 minutes. On double play tape, it is 1 hour. At 1-7/8" ips, the recording time is 90 minutes on long play tape, and 2 hours on double play tape.

The recorder operates from four 4.5-volt torch batteries.

Distributed by:

Ercona Corporation
16 W. 46th St.
New York 36, N. Y.

SET 493 FOLDER 16

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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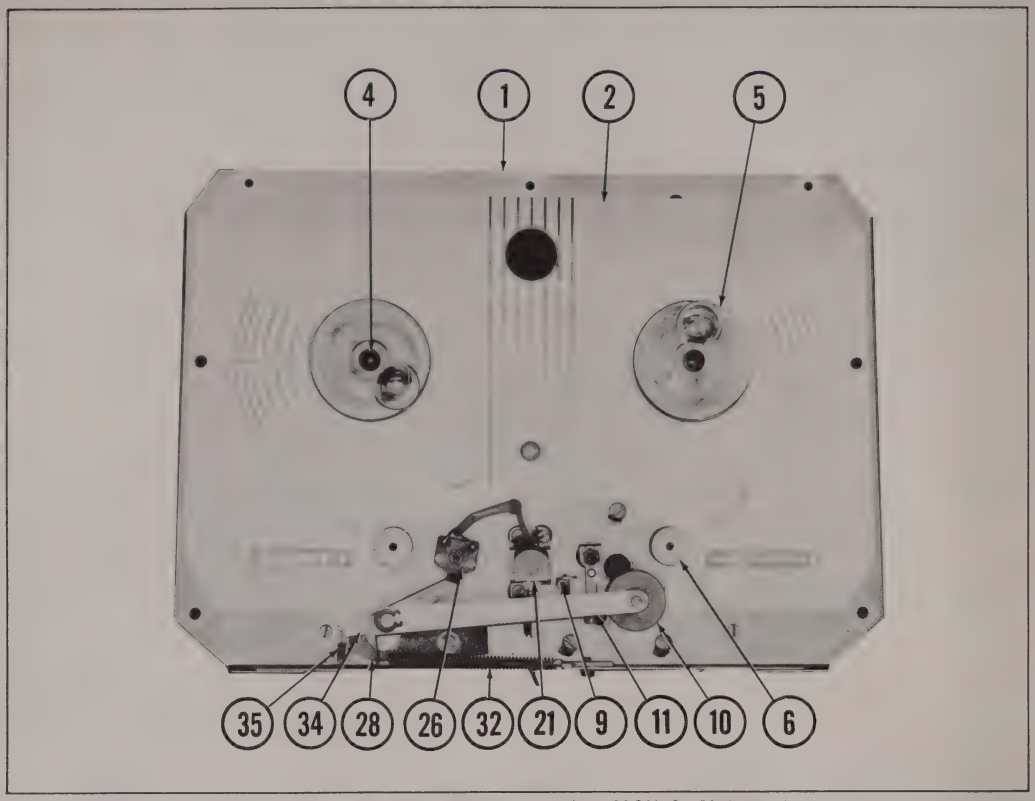


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

RECORDER OPERATION

Preparing for Operation

1. Install the four batteries in their cases.

Function Of Controls

Stop

Depressing the stop pushbutton, turns off the power to the recorder.

Rewind

To rewind the tape, depress the rewind and the stop buttons simultaneously. To stop the unit after the tape has been rewound onto the take-up reel, depress the stop button.

The rewind button will release and the unit will shut off.

Fast Forward

To advance the tape onto the take-up reel, depress the fast forward and stop buttons simultaneously. To stop the tape, depress the stop button. The fast forward button will release.

Playback

Depress the playback button. The tape will not move. Allow sufficient time for the amplifier to warm up and then slide the red button to the left and the tape will then be in motion.

Record

Slide the green button toward the front and then depress the record button. The magic eye will light but the tape will not be in motion. Turn the volume up and speak into the microphone in a normal voice until the magic eye begins to flicker. Slide the red button to the left to start the tape moving.

Volume

To increase the volume, turn the control clockwise; to decrease the volume, turn the control counterclockwise.

Speed Change

This control selects the speed at which the recorder will operate.

Threading the Tape

1. Remove the dust cover.
2. Place a reel of tape on the supply reel and an empty reel on the take-up reel.
3. Unwind a section of tape and insert it into the tape slot; make sure the dull coated side faces the head.
4. Insert the free end of the tape into the slot of the take-up reel and turn it a few turns counter-clockwise to secure the tape to the take-up reel and all slack is taken up between reels.

To Make a Recording

1. Thread tape as described under "Threading the Tape".
2. Plug the microphone into its jack. If a recording is going to be made from a radio, television receiver or phonograph the transcription lead should be used and the connection from the source should be between the black and green plug.
3. Push the record lock toward the front of the recorder and depress the record pushbutton.
4. Allow a few seconds for the amplifier to warm up and then slide the red button to the left to start the tape in motion.
5. Adjust the volume control so the line in the magic eye does not reduce to more than half its original length on the loudest passages of speech or music.
6. After the recording is completed, depress the stop pushbutton. The record button will automatically release.

To Play a Recording

1. Thread tape as described under "Threading the Tape".
2. Depress the replay button. This turns the amplifier on and starts the motor.
3. Slide the red button to the left and the tape will start moving.
4. Adjust the volume control to the desired listening level.

Dual-Track Recording

1. After a reel of tape has been recorded, and all of the tape has been wound onto the take-up reel, depress the stop button.
2. Remove the reels from the recorder. Turn the full reel over and place it on the left reel hub; turn the empty reel over and place it on the right reel hub.
3. Thread the tape properly and proceed with the recording.
4. After the second track has been recorded, the first track can be played without rewinding by reversing the reels as described in Step 2.

To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other, recordings to be edited should be limited to one track only.

1. Tape can be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements, etc., can be inserted between selections. Unused sections of tape can be spliced for re-use.
2. For best results, cut tape at a slight diagonal, join ends with splicing tape on the glossy side, and trim any excess width.

DISASSEMBLY

To Remove Tape Recorder from Case

1. Remove carrying handle.
2. Open the back cover.
3. Lift the two battery cases out and place to the side.
4. Remove the four screws, two on each side, holding the recorder to the case.
5. Lift the recorder out of the case.
6. Remove the two screws at the top and two at the bottom of the speaker.

NOTE: When reassembling the recorder, make sure the grey wire is connected to the ground lug of the speaker.

7. To reassemble, reverse the foregoing procedure.

To Remove Amplifier from Tape Transport

1. Disconnect the speaker leads, leads to motor terminal board, green lead to the winding motor, leads to the switch mounted on the capstan motor housing, leads to the erase head, and leads to the record head. Mark each lead when removing so they can be reconnected to the correct terminals.

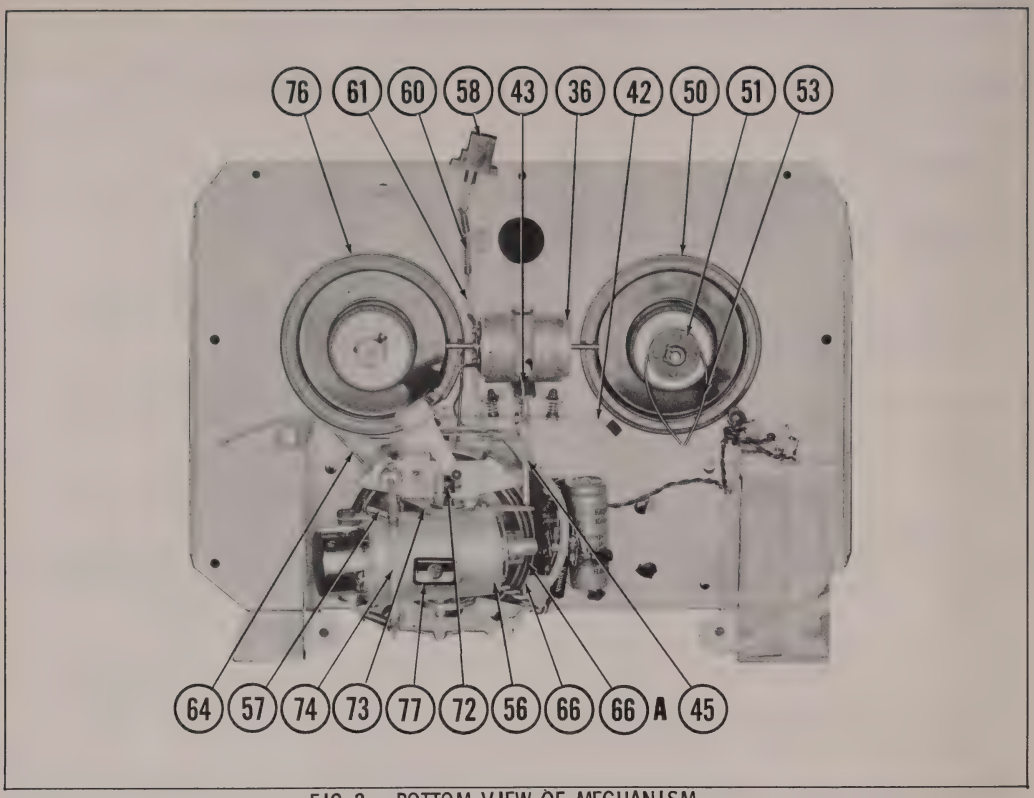


FIG.2 BOTTOM VIEW OF MECHANISM

2. Remove the screws holding the amplifier to the tape transport mechanism.
3. Lift amplifier slightly and disconnect all springs.
4. To reassemble, reverse the foregoing procedure.

To Remove the Capstan Motor

1. Set the motor to the 1-7/ 8" ips position.
2. Remove two screws from the solder lugs which hold the two springs.
3. Remove the two pivot screws from the motor and lift the motor out.
4. Unsolder the motor leads from the motor control board next to the flywheel.
5. To reassemble, reverse the foregoing procedure.

To Remove the Flywheel

1. Remove take-up drive spring belt (64).
2. Unsolder the blue, black, and yellow leads from the terminal board.
3. Remove the muting switch.
4. Remove the head cover (7).
5. Remove three screws holding the flywheel cradle to the tape deck.
6. Remove the flywheel unit.
7. Remove four screws holding the bridge and flywheel.
8. To reassemble, reverse the foregoing procedure.

NOTE: If there are shims under the spacers of the cradle, they must be put back when reassembling the cradle to the tape deck.

To Remove Wind-Rewind Motor

1. Remove the tension springs and their brackets.
2. Unsolder the motor leads.
3. Remove the two motor retaining screws and pivot screw.
4. Lift motor out.
5. To reassemble, reverse foregoing procedure.

ADJUSTMENTS

Capstan Motor and Flywheel

There should be 40 to 45 grams pressure on the drive pinion of the motor measured at 3-3/4 ips. To get the correct pressure, turn the two solder lugs, to which the two springs are connected, until the correct pressure is obtained.

Control Rod

Adjust Adjusting Brush (46) on center control rod for .025 inches of play with replay button depressed.

Record-Playback Head

1. Adjust the head vertically by the three screws that hold the mounting plate (20). The head must be parallel to the tape.
2. Thread a test tape onto the recorder.
3. Connect a volt meter to the black and yellow plugs of the transcription lead.
4. Adjust the right hand screw between the heads for maximum deflection on the meter while playing the test tape.

Tape Speed

If the tape speed is too slow, turn the grub screw (accessible through a hole in the regulator cover) clockwise. Turn it counterclockwise if the speed is running too fast.

CLEANING

As the tape passes over the heads, pressure roller (10), and capstan, tape residue will adhere to these parts. Clean the heads with a good head cleaning solvent. Clean the pressure roller (10) and capstan with alcohol.

LUBRICATION

Use a nonhardening type grease on the capstan motor pivots.

TROUBLE CHART

Symptom	Cause	Remedy
No fast rewind or fast forward.	1. Motor not engaging the rewind wheel (39) or forward wheel (76) properly.	1. Bend the tension spring brackets slightly to put more or less tension on the springs.
	2. Weak batteries.	2. There should be at least 7 volts for good winding. If voltage is less than 7 volts, replace batteries.
	3. Faulty motor.	3. Replace motor.
Unit does not stop when the pause control is depressed.	1. Spring (60) does not have enough tension.	1. Shorten spring (60) one or two turns.
Wow and flutter.	1. Bump on flywheel rubber ring (66A).	1. Replace flywheel rubber ring (66A).
	2. Flywheel (66) not running freely.	2. Replace flywheel (66).
	3. Counter sticking.	3. Replace counter.
	4. Excessive friction in reel hubs (4).	4. Check reel hubs (4) for sufficient clearance.
Does not operate at 1-7/8 ips.	1. Motor does not contact flywheel.	1. Check spring support for correct position.

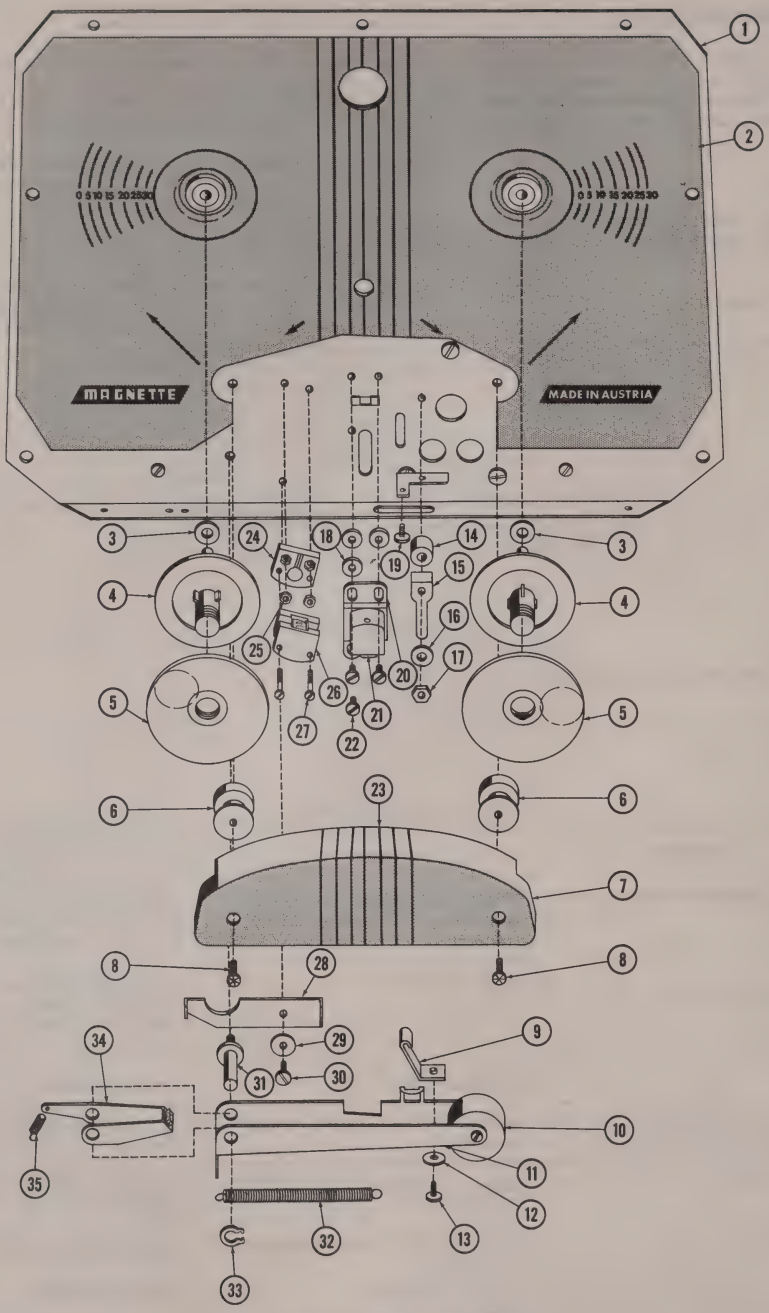


FIG.3A EXPLODED VIEW OF PARTS ABOVE DRESS PLATE

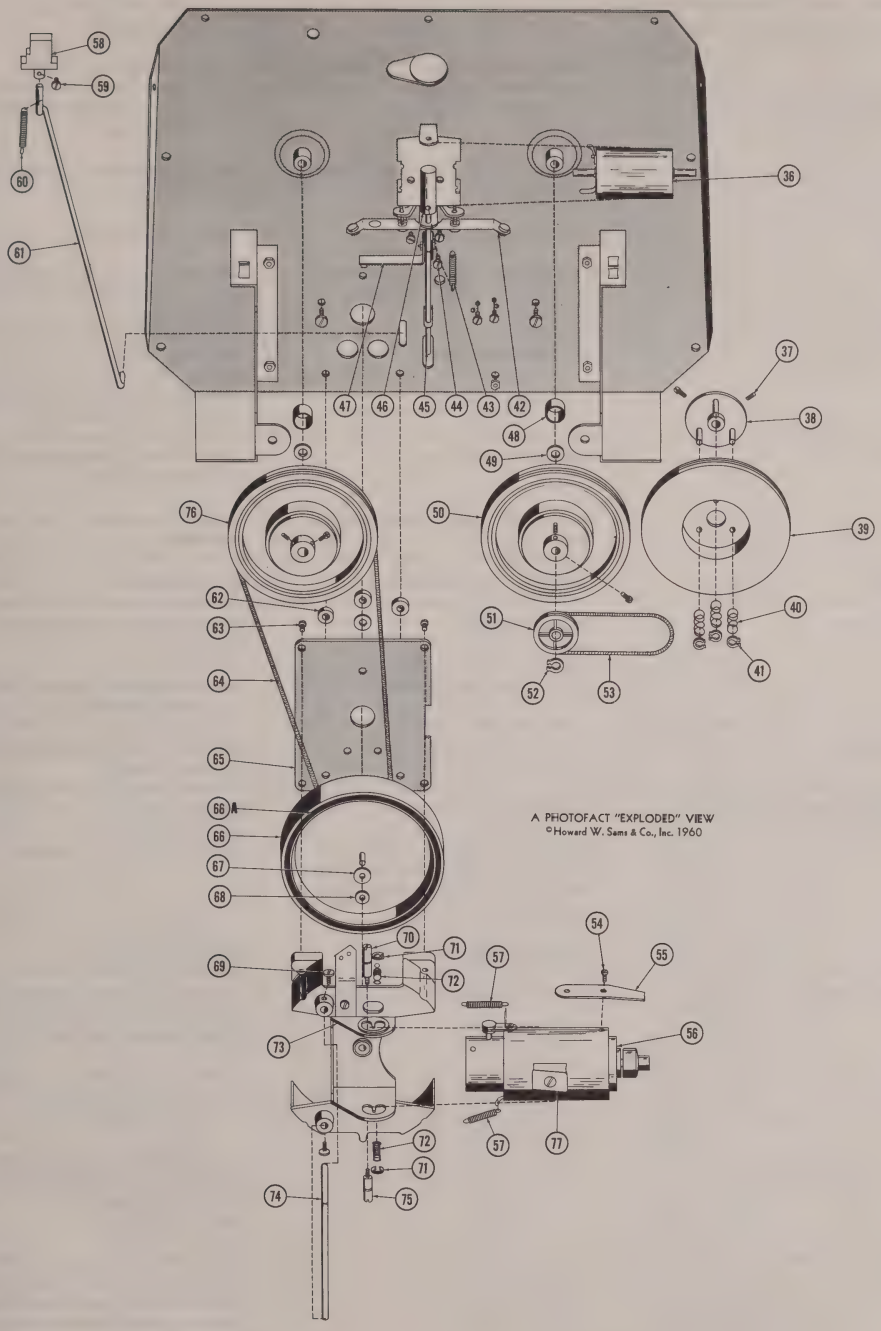


FIG.3B EXPLODED VIEW OF PARTS BELOW BASE PLATE

TROUBLE CHART (CON'T.)

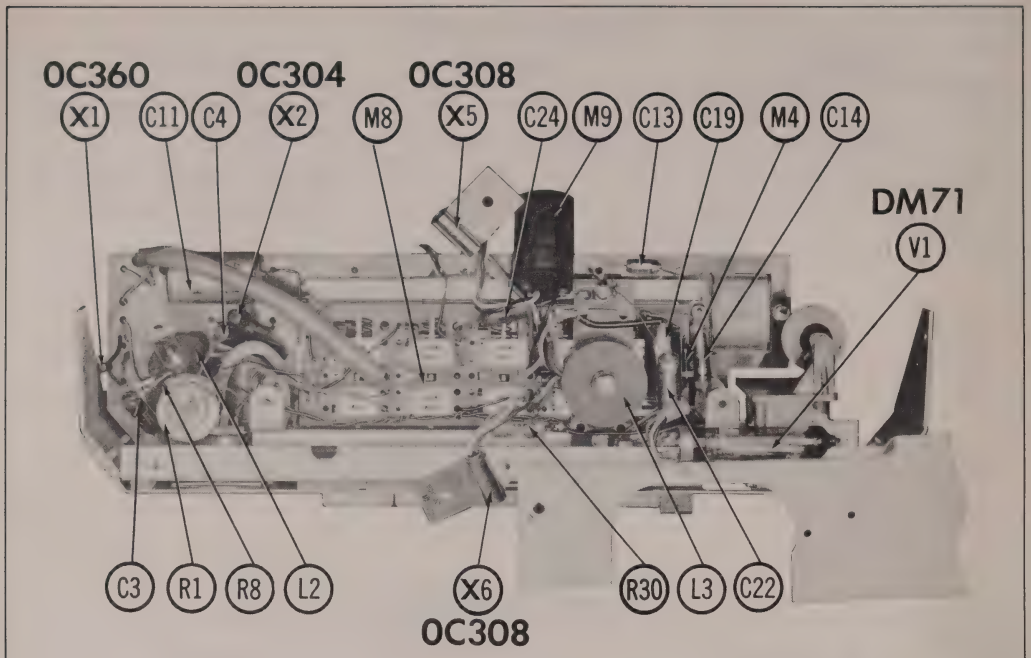
Symptom	Cause	Remedy
Counter does not operate.	1. Nylon wheels sticking.	1. Replace counter.
	2. Counter drive belt (53) missing.	2. Replace drive belt (53).
Magic eye inoperative.	1. Low battery voltage.	1. If voltage is below 6 volts, replace batteries.
	2. No voltage across the erase head (26).	2. Check oscillator coil for broken wire and resolder.
	3. Magic eye defective.	3. Replace magic eye.
	4. Electrolytic condenser between the second and third stage defective.	4. Change the 10mfd, 6 volt condenser between the second and third stage.
No playback.	1. Head disconnected.	1. Reconnect head.
	2. Tape may be blank.	2. Check with another tape which has a good recording on it.
Distortion.	1. Low battery voltage.	1. Check to see if the battery voltage is at least 6 volts.
	2. Electrolytic condenser defective.	2. Check amplifier circuit per schematic.
Rattle.	1. Speaker cone damaged.	1. Replace speaker.
Drop outs.	1. Defective tape.	1. Replace with tape known to be good.
	2. Tension spring (35) weak.	2. Replace tension spring (35) or cut a few turns off it.
Whistling.	1. Green wire broken off the oscillator coil.	1. Resolder the green wire to the oscillator coil.
Battery state indicator does not operate.	1. Low battery voltage.	1. Replace batteries.
	2. Defective 330-ohm resistor on motor control board on late models. On early models, 200- or 220-ohm resistor.	2. Replace defective resistor.
	3. Indicator defective.	3. Replace indicator.
Motor noise.	1. Noise cancelling coil not effective.	1. (a) Motor current should be between 45-55 milliamps. If over 55 milliamps, replace motor. (b) Replace the 200-ohm resistor on the motor control board with a 330-ohm resistor. (c) Insert a 47-ohm resistor between the yellow wire from transistor base and lug 3 of motor control board. (d) Insert a short piece of braided shielding under the rubber which holds the motor inside the screening tube opposite the screw which holds the regulator cover. (e) Remove screw on side with braided shielding and reinsert screw through braid to clamp it.

TROUBLE CHART (CON'T.)

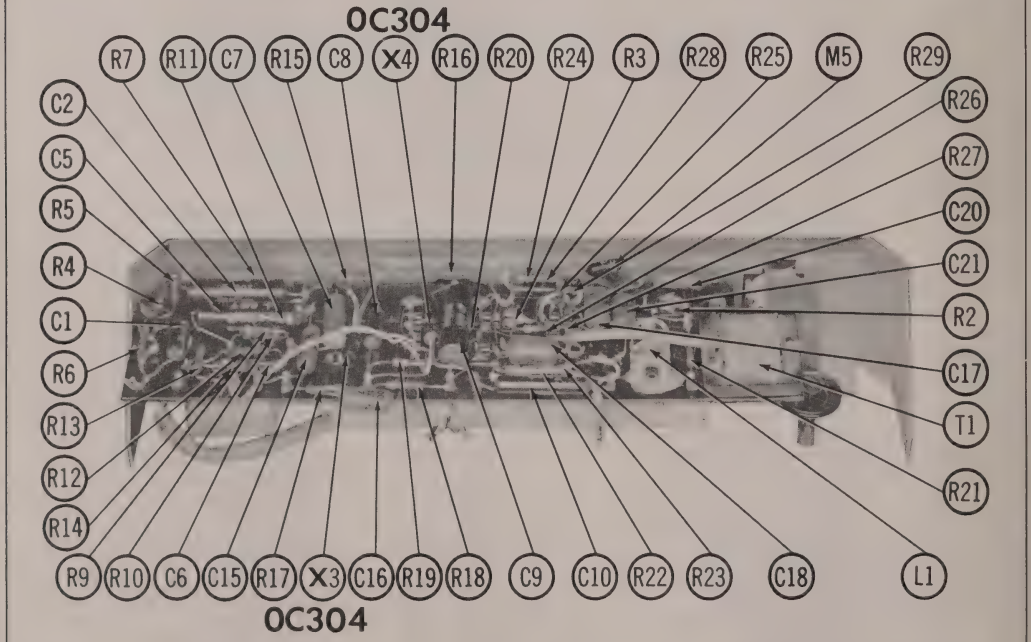
Symptom	Cause	Remedy
		(f) Solder braid to solder lug on motor housing. (g) Solder a wire between first lug of motor control board and chassis for better grounding. (h) Remove noise cancelling coil and insert a short strap between the appropriate switch contacts. (i) Insert a 10,000mmf condenser from the black battery wire and chassis.

MECHANICAL PARTS LIST

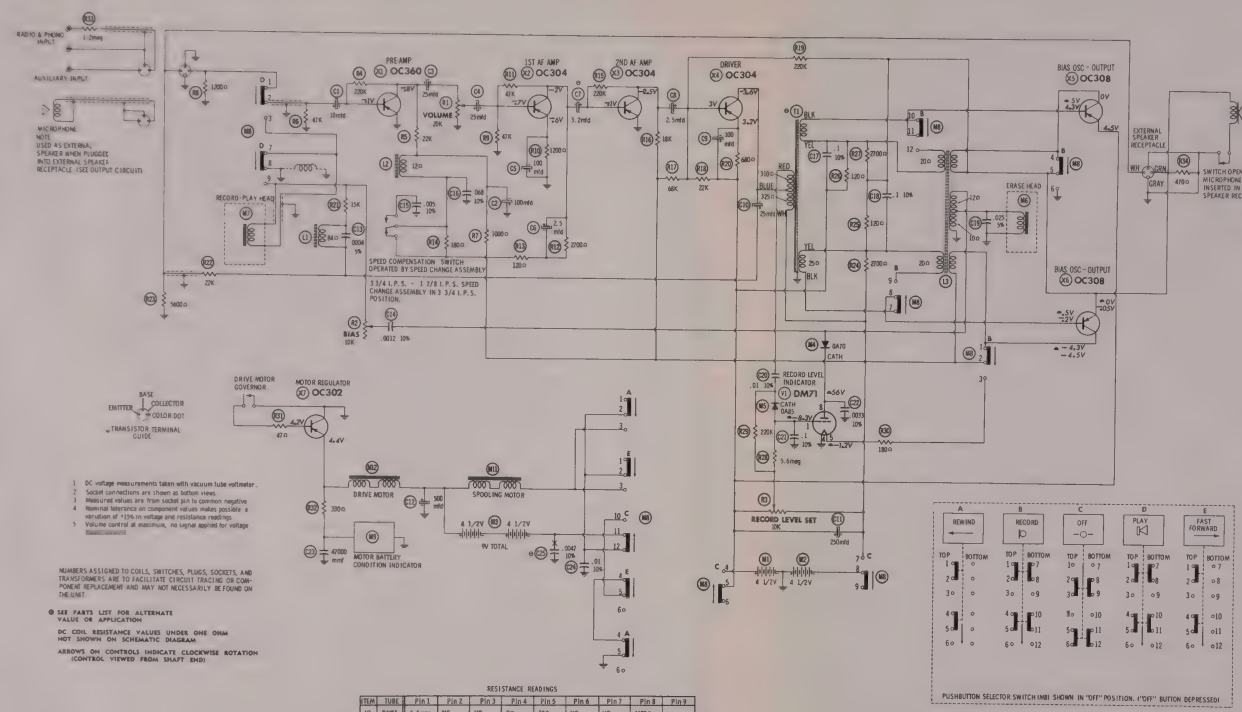
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Baseplate	40		Spring
2		Dress Plate	41		Grip Ring
3		Fiber Washer	42	829	Leaf Spring
4	U180	Reel Hubs	43	785	Tension Spring
5		Reel Holders	44		Set Screw
6	780	Tape Guide	45	776	Switch Rod
7	803	Head Cover	46	786	Adjusting Brush
8		Head Cover Screws	47		Brake Spring
9	916	Pressure Arm Tape Guide	48		Fiber Sleeve
10	U184	Pressure Roller	49		Felt Washer
11	782	Pressure Arm	50	U185A	Rewind Wheel
12		Flat Washer	51	801	Counter Drive Wheel
13		Screw	52		Grip Ring
14		Spacer	53	838	Counter Drive Belt
15	U212	Center Tape Guide	54		Screw
16		Fiber Washer	55		Motor Lift Lever
17		Hex Nut	56	820	Capstan Motor
18		Rubber Spacer	57	825	Tension Spring
19		Screw	58		Pause Control Knob
20	368/596	Record Head Support Plate	59		Set Screw
21	835	Record-Play Head	60		Tension Spring
22		Head Mounting Screws	61	905	Pause Control Guide
23	803	Head Cover	62		Plate Spacers
24	757	Erase Head Support Plate	63		Screw
25		Hex Nut, Erase Head Support Plate	64	837	Take-up Drive Spring Belt
26	834	Erase Head	65	794	Plate
27		Erase Head Mounting Screws	66	U186	Flywheel
28	792	Intermediate Lever	66A	762	Flywheel Rubber Ring
29		Washer	67		Fiber Washer
30		Screw	68		Metal Washer
31	807	Pressure Arm Support Pin	69		Set Screw
32	833	Tension Spring	70	881	Long Pivot Screw
33		Grip Ring	71		Grip Ring
34	U194	Tape Pressure Arm	72	825	Tension Spring
35	836	Tension Spring	73	U191	Drive Unit Casting
36	821	Wind-Rewind Motor	74	839	Wire Bridge
37		Set Screw	75	795	Short Pivot Screw
38	763	Drive Unit	76	U185B	Forward Wheel
39	U185A	Rewind Wheel	77	893	Speed Change Knob.



AMP CHASSIS - TOP VIEW



AMP CHASSIS — BOTTOM VIEW



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC CON. RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	DM71	5.6meg	NC	NC	∞	1.8Ω	NC	NC	1600Ω	

ALL MEASUREMENTS MADE IN "PLAY" POSITION
➧ MEASURED IN "RECORD" POSITION.
RESISTANCE MEASUREMENTS NOT GIVEN FOR X1 THRU X7 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
®Howard W. Sams & Co., Inc. 1960

STUZZI MODEL 671-B

AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Record Level Indicator	DM71			

TRANSISTORS

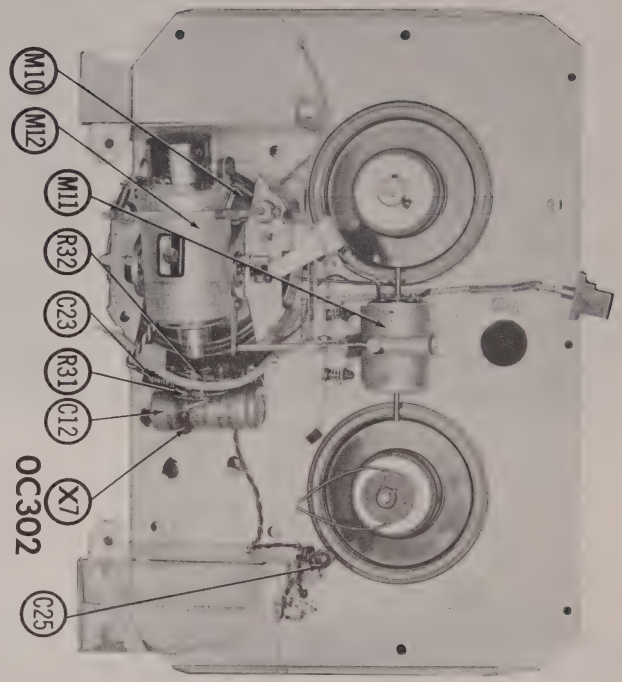
ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC360	Preamplifier		OC360			PNP
X2	OC304	1st AF Amplifier		OC304			PNP
X3	OC304	2nd AF Amplifier		OC304			PNP
X4	OC304	Driver		OC304			PNP
X5	OC308 *	Output-Bias Osc.		OC308			PNP) Matched
X6	OC308 *	Output-Bias Osc.		OC308			PNP) Pair
X7	OC302	Motor Regulator		OC302			PNP

* With Heat Sink.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	STUZZI PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	6		PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C2	100	6		PWE6100	EC100-6	TT6X100	ML100-6	TE-1102	
C3	25	6		PWE6025	EC6-25	TT6X25	ML30-6	TE-1091	
C4	25	6		PWE6025	EC6-25	TT6X25	ML30-6	TE-1091	
C5	100	6		PWE6100	EC100-6	TT6X100	ML100-6	TE-1102	
C6	2.5	6		PWE6003	EC3-6	TT6X3	ML4-6	TE-1082	
C7	3.2	70		PWE6003	EC3-6	TT150X3	ML4-6	TE-1082	①
C8	2.5	6		PWE6003	EC3-6	TT6X3	ML4-6	TE-1082	
C9	100	6		PWE6100	EC100-6	TT6X100	ML100-6	TE-1102	
C10	25	6		PWE6025	EC6-25	TT6X25	ML30-6	TE-1091	
C11	250	12		PRS1100	BR2501	TC50025		TE-1138	
C12	500	12		PRS1170	BR5001	TC1505		TVA-1132	

① Some versions may use 10mfd@6V in this application.



MECHANICAL UNIT — BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	.0004 125V 5%				5R5T4	CM-19B-391J	MCE243	MS-34
C14	.0012 125V 10%		P684CM-0012			6DP-1-122	MCJ455	5BF-D12
C15	.005 125V 10%		V84C2D47-10%		STM4D47	6DP-1-502	JL-250	2WF-D47
C16	.068 125V 10%		V84C2S68-10%		STM4S68	4DP-3-683		2WF-S68
C17	.1 125V 10%		V84C2P1-10%		STM4P1	20P-3-104		2WF-P10
C18	.1 125V 10%		V84C2P1-10%		STM4P1	2DP-3-104		2WF-P10
C19	.025 125V 5%					4DP-2-253-5%		5BF-S27
C20	.01 125V 10%		V84C2S1-10%		STM4S1	4DP-1-103		2WF-S10
C21	.1 125V 10%		V84C2P1-10%		STM4P1	2DP-3-104		2WF-P10
C22	.0033 125V 10%		V84C4D33-10%		STM4D33	6DP-1-332	JL-233	5BF-D33
C23	47000			DD-503	STM4S47	4DP-3-473	GP150	5HK-S50
C24	.01 125V 10%		V84C2S1-10%		STM4S1	4DP-1-103	GEM-1611	2WF-S10
C25	.0047 125V 10%	Note 1	V84C2D47-10%		STM4D47	6DP-1-472	GEM-16247	5BF-D47

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STUZZI PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	20K	1/2						Volume
R2	10K	1/4						Bias
R3	10K	1/4						Record Level Set.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	220K	
R5	22K	
R6	47K	
R7	1000Ω	
R8	1200Ω	
R9	47K	
R10	1200Ω	
R11	47K	
R12	2700Ω	
R13	120Ω	

ITEM No.	RATING	REMARKS
R14	180Ω	
R15	220K	
R16	18K	
R17	68K	
R18	22K	
R19	220K	
R20	680Ω	
R21	15K	
R22	22K	
R23	5600Ω	

ITEM No.	RATING	REMARKS
R24	2700Ω	
R25	120Ω	
R26	120Ω	
R27	2700Ω	
R28	5.6meg	
R29	220K	
R30	180Ω	
R31	47Ω	
R32	330Ω	
R33	1.2meg	
R34	470K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		STUZZI PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke							43MH
L2	RF Choke							
L3	Bias Osc. Coil							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STUZZI PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.		
T1	28	1 SEC. 2 1	ZT-3101①							

① Alternate Part #864.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STUZZI PART No.	QUAM PART No.	
SP1	4"	PM	30-32Ω			

BATTERIES

ITEM No.	VOLTAGE	STUZZI PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	4½V			532		703		M-706	① Two Required
M2	4½V			532		703		M-706	
M3	4½V	①		532①		703①		M-706①	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		STUZZI PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	OA85					Rectifier, Record Ind. Plate (Pigtail)
M5	OA70					Det., Record Ind. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	STUZZI PART No.	NOTES
M6	Head	834	Erase
M7	Head	835	Record-Replay
M8	Switch		Pushbutton Type (Complete)
M9	Battery Life Indicator	845	
M10	Drive Unit	763	
M11	Motor	821	Spooling (Fast, Forward, Rewind)
M12	Motor	820	Capstan (Drive)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

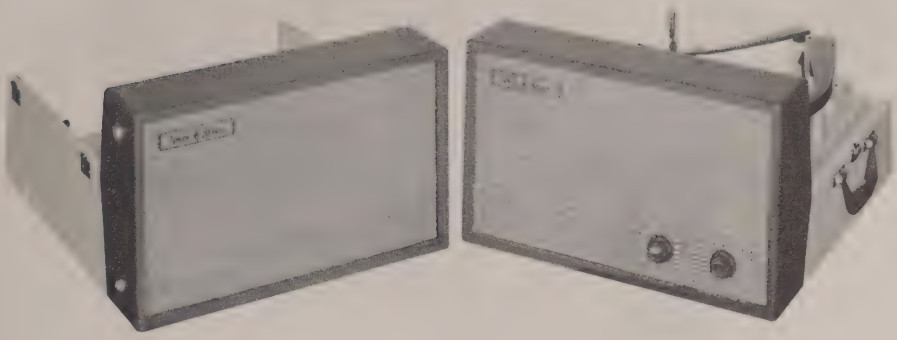
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

V-M MODEL
314



V-M MODEL
314

TRADE NAME	V-M Model 314
MANUFACTURER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 33 Watts, .38 Amp @ 117 Volts (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18

SET493 FOLDER 17

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JT758

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp - Channel 2 AF Amp	12AX7	V2 V3	Channel 1 Output Channel 2 Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■80	200	12122	AFH3-25-50	CO236	FP33L 3	TMT-30	TVL-3585	
B	▲50	200							
C	50	200							
C2	10	25	12046	PRS1250	BBR10-25	TC22	TD10-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	1000			BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C5	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C7	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C9	5000			BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C10	1000			BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C12	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C13	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14	2000			BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C15	5000			BPD-005	DD-502	BYA10D5	CCD-502	GP502	5HK-D50
C16	.047	600V		P688N-047	DD-503	CUB6S47	6DP-3-473	6DP-3-473	6TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		12390					Volume, Channel 2
	200K tap							
B	2meg							Volume, Channel 1
	200K tap							
R2A	1meg		12391	B-70	AD47-1meg-Z		FA16A	Tone, Channel 1
B	1meg			SR-70	Not Req		RU16A	Tone, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	

RESISTORS

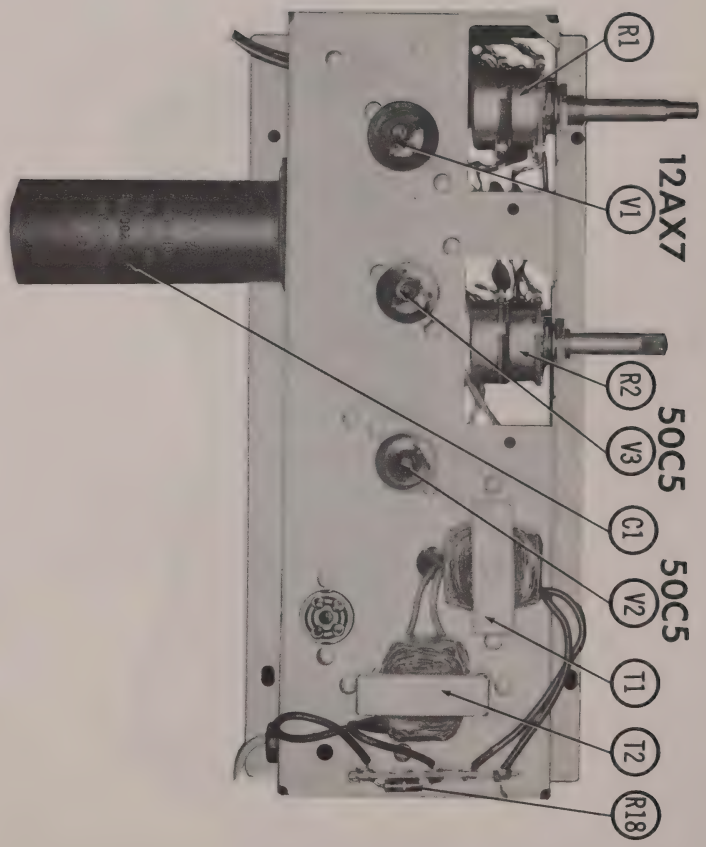
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	100K	
R4	6.8meg	
R5	470K	
R6	4700Ω	
R7	470K	
R8	120Ω 2W	

ITEM No.	RATING	REMARKS
R9	100K	
R10	6.8meg	
R11	470K	
R12	4700Ω	
R13	470K	
R14	1500Ω 1W	

ITEM No.	RATING	REMARKS
R15	68Ω 1W	
R16	10Ω 1W	
R17	33Ω 2W	
R18	100Ω	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3-4Ω	12632-3 ①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	
T2	2400Ω	3-4Ω	12632-3 ①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

① Alternate Part #12632

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA V-M PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5-1/4"	PM	3-4Ω	19322	52A1	
SP2	5-1/4"	PM	3-4Ω	19322	52A1	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA V-M PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.100A	12602 *	2E4 *	HA154 *	K200 *	SR200 *	*Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA V-M PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	19814-A			26V				10T2-S	N-10T2-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA V-M PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	(Part of M2)		W-60X † or W-60D ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Switch	467	Off-On (Part of Changer)
M5	Motor only	20861	Complete (Part of Changer)

CABINETS & CABINET PARTS

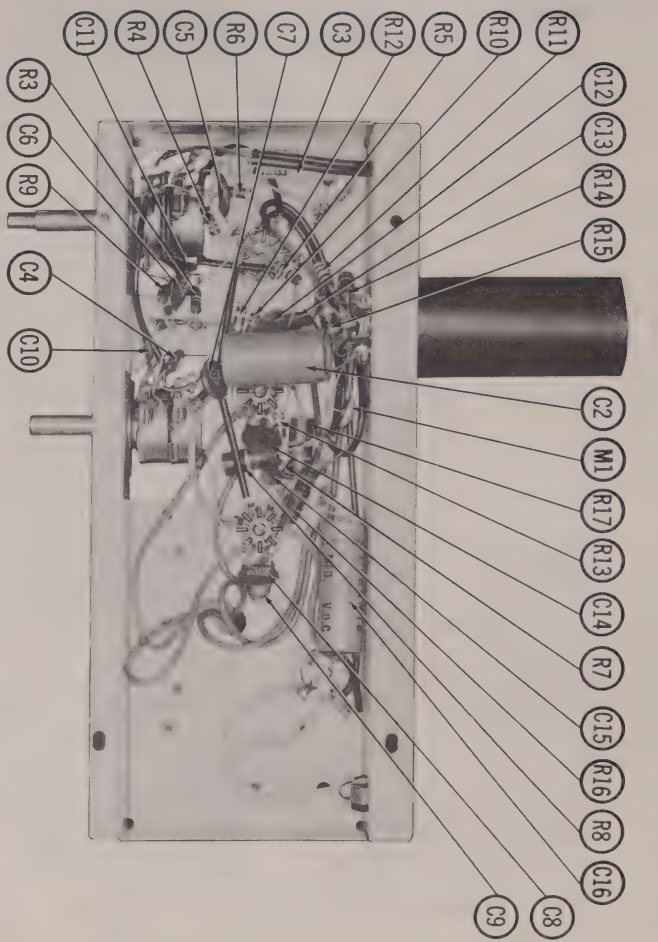
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

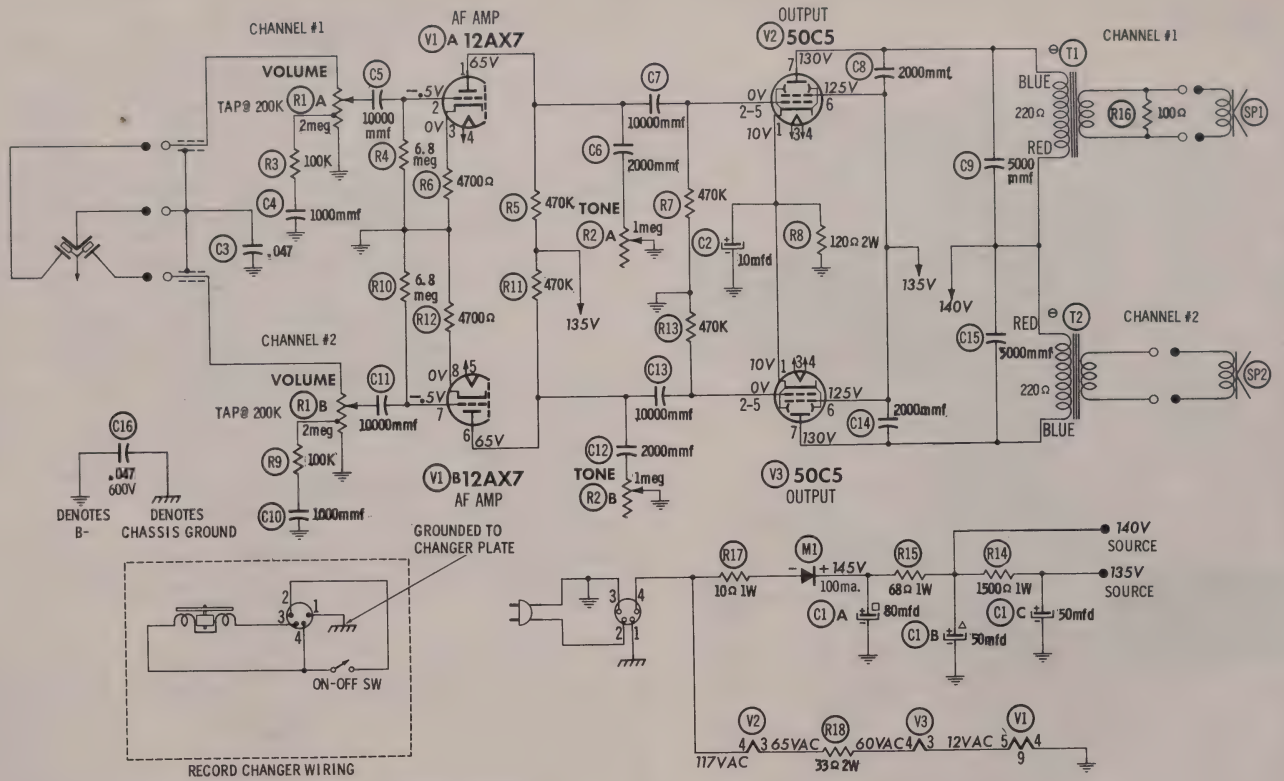
NAME	PART NO.	DESCRIPTION
Knob	19726-B	Outer
Knob	19725-B	Inner
Knob	16828-D	Tone
Knob	2907-A46	Reject
Knob	20815-A46	Speed control
Cabinet	20819-A	Complete
Handle	20877.	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†472K	6.8meg	4700Ω	0Ω	17Ω	†472K	6.8meg	4700Ω	NC
V2	50C5	120Ω	470K	80Ω	140Ω	470K	†1600Ω	†280Ω		
V3	50C5	120Ω	470K	17Ω	55Ω	470K	†1600Ω	†280Ω		

† MEASURED FROM OUTPUT M1.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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V-M MODEL 314

PHOTOFACT® Folder

WESTINGHOUSE MODELS H-56ACS1, H-56ACS2 (Ch. V-2507-2)

WESTINGHOUSE MODELS H-56ACS1, H-56ACS2 (Ch. V-2507-2)

MODEL H-56ACS2

WESTINGHOUSE MODELS H-56ACS1, H-56ACS2 (Ch. V-2507-2)

TRADE NAME	Westinghouse Models H-56ACS1, H-56ACS2 (Ch. V-2507-2)
MANUFACTURER	Westinghouse Electric Corp., Radio-TV Div., Metuchen, N. J.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 30 Watts, .32 Amp @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #670V010H02 - SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 493 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JT967

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp - Right Channel AF Amp	12AX7

ITEM No.	USE	TYPE
V2	Left Channel Output	50C5
V3	Right Channel Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WESTINGHOUSE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	160	218V044H01	AFH4-42	DO-350	FP422.7	TMQ-40	TVL-4635.7	
B	20	150							
C	■80	150							
D	▲40	150							
C2	20	25	218V025H10	PRS1330	BBR20-25	TT25X20	TD-20-150	TVA-1410	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.022	600V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C4	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C5	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C6A	4700			BPD-2X0047	DD3-502	BYD6DD5	CCD-472	B2X250	5HK-2D47
B	4700						CCD-472		
C7	470			BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C8	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C9	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C10	470			BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C11	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C12	.047	600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WESTINGHOUSE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	270V088H01	B-79	AD47-1meg-Z		FB16A	Loudness, Left Channel
B	1meg	½		SR-79	Not Req		RU16A	Loudness, Right Channel
C	Shaft			Not Req	FS-3		CS3500	
R2A	1meg	½	270V088H05	B-69	AD47-1meg-S		FB16L	Treble, Left Channel
B	1meg	½		SR-69	Not Req		RU16L	Treble, Right Channel
C	Shaft			Not Req	FS-3		CS3500	
R3A	3meg	½	270V088H02	B-84			FA36L	Bass, Left Channel
B	3meg	½		SR-84			RU36L	Bass, Right Channel
C	Shaft			Not Req			CS3500	
R4A	500K	½	270V088H03		C47S-500K-S	B11-133	PP55L	Balance
B	Switch				Not Req	SK7	Not Req	Push Pull Off-On

RESISTORS

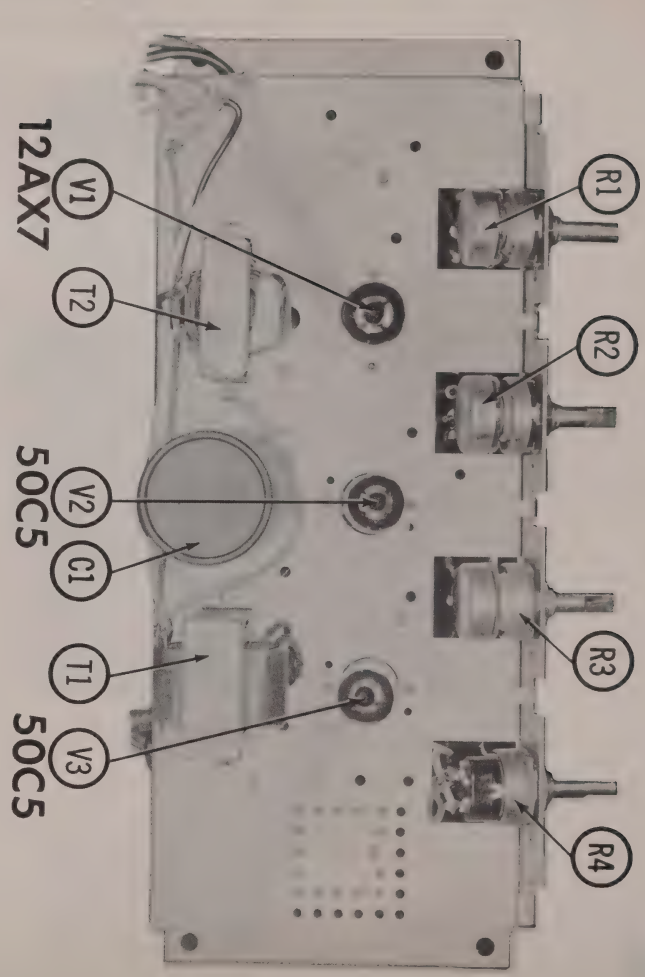
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	6.8meg	
R6	330K	
R7	10K	
R8	100Ω 1W	

ITEM No.	RATING	REMARKS
R9	6.8meg	
R10	330K	
R11	10K	
R12	150Ω	

ITEM No.	RATING	REMARKS
R13	150Ω 2W	
R14	10K	
R15	47Ω 3W	
R16	47Ω 3W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: WESTINGHOUSE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω CT	4-6Ω CT	430V080H01							
T2	1800Ω	4-6Ω	430V081H01	24S63 ①				24S63 ①		

① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: WESTINGHOUSE PART No.	QUAM PART No.	NOTES
SP1	6"	PM	4-6Ω	570V068H02	6A1Z4. 8	
SP2	6"	PM	4-6Ω	570V068H02	6A1Z4. 8	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: WESTINGHOUSE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.080A	295V015H02 *	RS150 *	1235AH *	150Z *	SR200 ♦	*Selenium ♦ Silicon

PHONO CARTRIDGE

ITEM No.	WESTINGHOUSE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	671V001H02	13T	Not Req.	13	Not Req	A-44X	Not Req.	107B2-S	Not Req.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: WESTINGHOUSE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	(Part of M2)	* W-204DS † or *W-204DD-1 ♦	* A-44X † or * A-44XSD † or *A-44XDD ♦	† Jewel ♦ Diamond * Includes cartridge

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M4	Motor		Phono Drive (Part of Changer)
M5	Switch		Off-On (Part of Changer)

CABINETS & CABINET PARTS

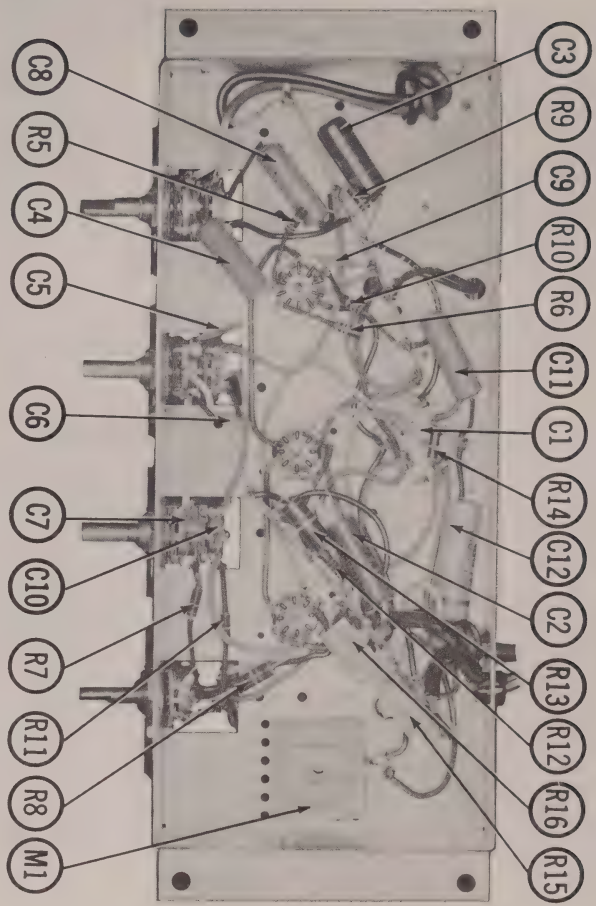
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

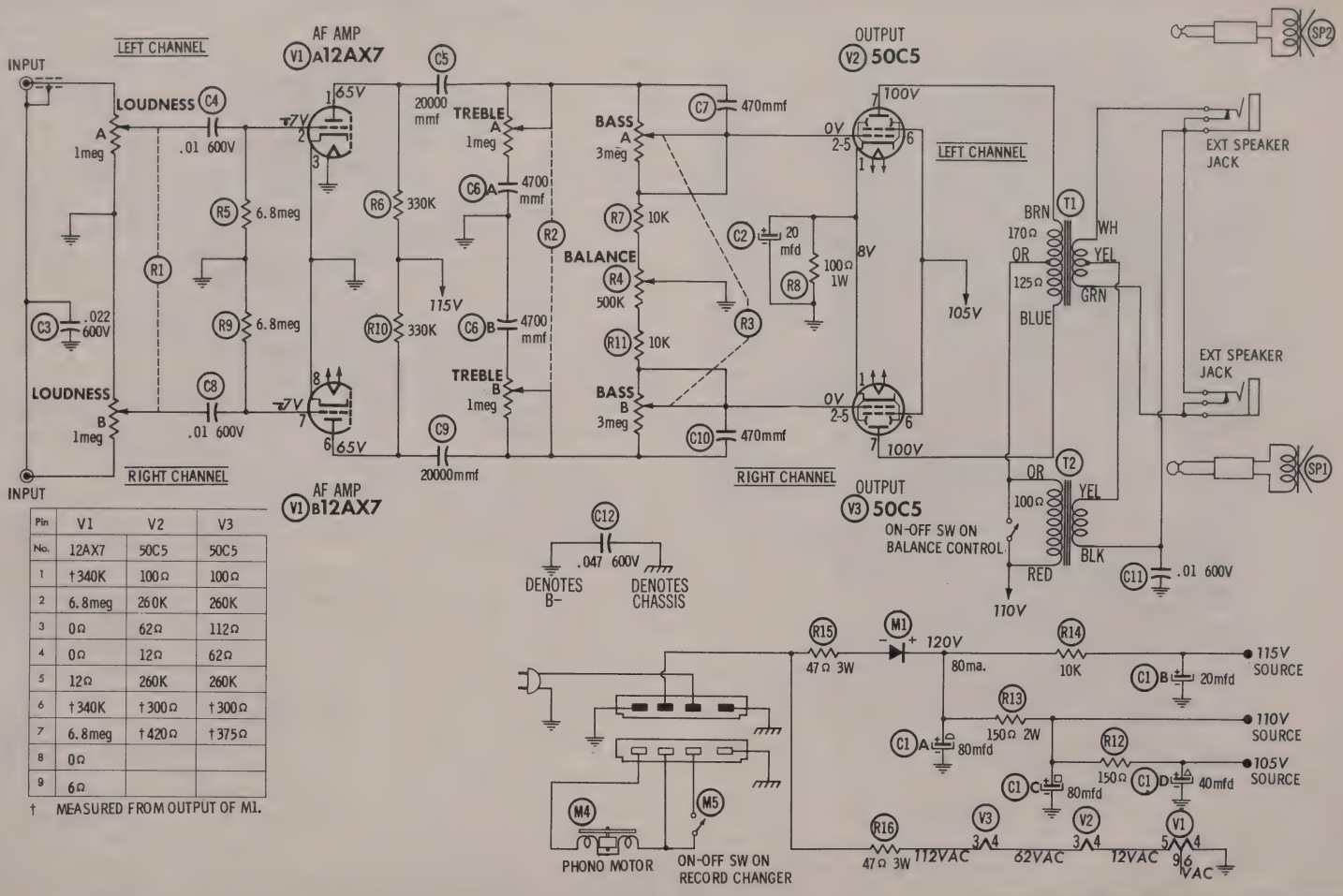
NAME	PART NO.	DESCRIPTION
Knob	550V118H01	All Controls
Cabinet	690V024H06	Center section, Model H-56ACS1
Cabinet	690V024H09	Center section, Model H-56ACS2
Cabinet	690V024H07	Speaker enclosure, right side, Model H-56ACS1
Cabinet	690V024H08	Speaker enclosure, left side, Model H-56ACS1
Cabinet	690V024H10	Speaker enclosure, right side, Model H-56ACS2
Cabinet	690V024H11	Speaker enclosure, left side, Model H-56ACS2

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





Pin No.	V1 12AX7	V2 50C5	V3 50C5
1	†340K	100Ω	100Ω
2	6.8meg	260K	260K
3	0Ω	62Ω	112Ω
4	0Ω	12Ω	62Ω
5	12Ω	260K	260K
6	†340K	†300Ω	†300Ω
7	6.8meg	†420Ω	†375Ω
8	0Ω		
9	6Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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WESTINGHOUSE MODELS H-56ACS1, H-56ACS2 (Ch. V-2507-2)

EIA PRODUCTION SOURCE CODE - 1960

Code symbols assigned to radio-television manufacturers and suppliers, arranged both alphabetically by companies and numerically by code numbers.

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ELECTRONIC INDUSTRIES ASSOCIATION
1721 De Sales Street, N. W. Washington, 6 D. C.

HOWARD W. SAMS & CO., INC.
Indianapolis 6, Indiana

ALPHABETICAL LIST

(* Indicates non-members)

Company	Code No.
*ACDC Electronics, Inc., Burbank, Calif.	1030
ACF Electronics, Division of ACF Industries, Inc., Alexandria, Va.	900
*Acme Coil & Transformer Corp., Chicago 14, Ill.	928
*Acme Electric Corporation, Cuba, N. Y.	413
*Acro Products Company, Philadelphia 28, Penna.	878
*Adams Electronics Inc., Bangor, Mich.	1092
Adler Electronics, Inc., New Rochelle, N. Y.	813
*Admiral Corporation, Chicago 47, Ill.	101
*Advanced Research Associates, Inc., Kensington, Md.	1062
Advance Ross Electronics Corp., Chicago 45, Ill.	286
*Aerolite Electronics Corp., Union City, N. J.	910
Aerovox Corporation, New Bedford, Mass.	102
*Ajax Condenser Co., Inc., Chicago 14, Ill.	705
Aladdin Electronics, a Division of Aladdin Industries, Inc., Nashville 10, Tenn.	689
*A.L.A. Industries, Inc., Harrison, N. Y.	1031
*Albergo Transformer Co., Chicago 22, Ill.	883
Alcon Metal Products, Inc., Chicago 47, Ill.	573
Allen-Bradley Company, Milwaukee 4, Wis.	106
The Alliance Manufacturing Co., Inc., Alliance, Ohio	107
All Star Products, Inc., Defiance, Ohio	110
Alpha Metals, Inc., Jersey City 4, N. J.	733
Altec Lansing Corporation, Anaheim, Calif.	391
American Electronics Company, Mineola, L. I., N. Y.	978
*American Lava Corporation, Chattanooga 5, Tenn.	681
*American Radionic Co., Inc., Danbury, Conn.	648
American Television & Radio Co., St. Paul 1, Minn.	551
*American Transformer Corp., Chicago 7, Ill.	892
Amperex Electronic Corporation, Hicksville, L. I., N. Y.	111
Amphenol-Borg Electronics Corp., Broadview, Ill.	554
*The Amplifone Corporation, Chicago 40, Ill.	1002
*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.	547
*Andrea Radio Corporation, Long Island City 1, N. Y.	113
Andrew Corporation, Chicago 19, Ill.	402
Andrews Tower, Inc., Fort Worth 19, Tex.	852
The Antenna Specialists Company, Cleveland 6, Ohio	920
Anton Electronic Laboratories, Inc., Brooklyn 37, N. Y.	961
*Apex Coil & Transformer Corp., Chicago 8, Ill.	849
A. R. F. Products, Inc., River Forest, Ill.	115
Armel Electronics Inc., Brooklyn 32, N. Y.	893
The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.	116
Arvin Industries, Inc., Columbus, Ind.	248
*Associated Transformer Corp., Chicago 47, Ill.	1035
*Astro-Tran, West Acton, Mass.	1104
Atlantic Wire & Cable Corp., College Point 56, N. Y.	792
Audio Devices, Inc., Rectifier Division, Santa Ana, Calif.	1051
Automatic Manufacturing Division, General Instrument Corp., Newark 4, N. J.	119
*Automatic Radio Mfg. Co., Inc., Boston 15, Mass.	120
Barker & Williamson, Inc., Bristol, Penna.	461
Barnes Metal Products Company, Chicago 23, Ill.	588
*Bartlett Manufacturing Company, Glenview, Ill.	985
Basler Electric Company, Highland, Ill.	695
The Bead Chain Manufacturing Co., Bridgeport 5, Conn.	122
Belden Manufacturing Company, Chicago 44, Ill.	579
Bendix Radio, Division of Bendix Aviation Corp., Baltimore 4, Md.	125
*Best Manufacturing Co., Inc., Irvington 11, N. J.	371
*Better Coil & Transformer Corp., Goodland, Ind.	831
*Blackburn Electronic Corporation, Wyoming, Pa.	912
Bliley Electric Company, Erie, Pa.	128
Bogen-Presto Division, The Siegler Corp., Paramus, N. J.	589
Bomac Laboratories Inc., Beverly, Mass.	940
*Bradford Components, Inc., Salamanca, N. Y.	1044
*Bradley Semiconductor Corporation, New Haven 11, Conn.	812
*Bristol Motors Div., Vocaline Co. of America, Inc., Old Saybrook, Conn.	1088
British Industries Corporation, Port Washington, L. I., N. Y.	409
Brubaker Electronics, Inc., Culver City, Calif.	817
*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.	1071
Caledonia Electronics & Transformer Corp., Caledonia, N. Y.	503
Callins Industries, Inc., Greenfield, Tenn.	1068
Cal-Ros Industries, Inc., Chicago 22, Ill.	1039
Calvideo Tube Corporation, Compton, Calif.	886
Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.	1017
C. F. Cannon Co., Springwater, N. Y.	133
*Carbonneau Industries, Grand Rapids 2, Mich.	719
*Cargo Packers, Inc., Glendale 27, N. Y.	901
*Carol Electronics Corporation, Martinsburg, W. Va.	837
Carter Parts Company, Skokie, Ill.	610
C-B-C Electronics Co., Inc., Philadelphia 20, Pa.	867
CBS Electronics, Division of Columbia Broadcasting System Inc., Danvers, Mass.	210
Celco (Constantine Engineering Labs. Co.), Mahwah, N. J.	692
Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.	134
*Central Coil Company, Indianapolis 22, Ind.	637
Central Electronic Manufacturers, Denville, N. J.	841
*Channel Master Corporation, Ellenville, N. Y.	1059
Chemtronic Corporation, Nashville 4, Tenn.	1064
*Chester Cable Corp., Chester, N. Y.	909
Chicago Condenser Corporation, Chicago 47, Ill.	135
*Chicago Electronic Engineering Co., Chicago 47, Ill.	166
*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.	138
Chicago Telephone Supply Corp., Elkhart, Ind.	137
*Cinaudagraph Inc., Chicago 26, Ill.	145
Cinch Manufacturing Company, Chicago 24, Ill.	139
Clarostat Mfg. Co., Inc., Dover, N. H.	140
*Cleveland Electronics, Inc., Cleveland 3, Ohio	433
Clevite Transistor Products, Waltham 54, Mass.	856
*Clippard Instrument Laboratory, Inc., Cincinnati 39, Ohio	530
*Coilcraft, Incorporated, Cary, Ill.	906
*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.	141
Collins Radio Company, Cedar Rapids, Ia.	439
*Columbia Technical Corporation, Woodside 77, N. Y.	1048
Columbus Electronics Corp., Semiconductor Div., Yonkers, N. Y.	1103
*Columbus Process Co., Inc., Columbus, Ind.	450
Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.	1019
*Communication Measurements Laboratory, Inc., Plainfield, N. J.	427

Company	Code No.
Connector Corporation, Chicago 30, Ill.	888
Conrac Incorporated, Glendora, Calif.	640
Consolidated Wire & Associated Companies, Chicago 16, Ill.	607
Continental Carbon, Div. of Wirt Company, Philadelphia 44, Pa.	145
*Controls Company of America, Schiller Park, Ill.	711
Convair/Pomona, Div. of General Dynamics Corp., Pomona, Calif.	896
Corning Glass Works, Corning, N. Y.	148
Cornish Wire Company, Inc., New York 7, N. Y.	149
Cosmic Radio Corporation, New York 59, N. Y.	704
Croname, Incorporated, Chicago 48, Ill.	151
Crosley Division, Avco Corp., Cincinnati 25, Ohio	152
Cubic Corporation, San Diego 11, Calif.	870
Dale Products, Inc., Columbus, Nebr.	816
J. W. Davis & Company, Dallas 35, Texas	563
*Davis Electric Company, Cape Girardeau, Mo.	628
*Dearborn Glass Company, Bedford Park, Ill.	385
*DeJur-Amsco Corporation, Long Island City 1, N. Y.	780
Delco Radio Division, General Motors Corporation, Kokomo, Ind.	466
*DeWald, Div. of United Scientific Labs. Inc., Long Island City 1, N. Y.	155
*Dinion Coil Co., Inc., Caledonia, N. Y.	895
R. L. Drake Company, Miamisburg, Ohio	851
Drake Manufacturing Company, Chicago 31, Ill.	586
Wilbur B. Driver Company, Newark 4, N. J.	156
DuKane Corporation, St. Charles, Ill.	252
Allen B. DuMont Laboratories, Inc., Electronic Tube Div., Clifton, N. J.	158
*DX Radio Products Company, Inc., Chicago 47, Ill.	159
Eberline Instrument Corporation, Santa Fe, N. M.	994
*Hugh H. Eby Company, Philadelphia 44, Penna.	160
*Efcon, Incorporated, New York 12, N. Y.	1106
Eitel-McCullough, Inc., San Carlos, Calif.	162
*Elco Corporation, Philadelphia 24, Penna.	599
Eldico Electronics, Division of Radio Engineering Laboratories, Inc., Long Island City, N. Y.	783
*Electrical Utilities Company, La Salle, Ill.	569
*Electrical Windings, Inc., Chicago 39, Ill.	682
*Electro Engineering Works, San Leandro, Calif.	1033
The Electro Motive Mfg. Co., Inc., Willimantic, Conn.	164
*Electronic Components Corporation, Chicago 8, Ill.	515
*Electronic Devices, Inc., Brooklyn 15, N. Y.	752
*Electronic Engineering Company of California, Santa Ana, Calif.	941
*Electronic Enterprises, Inc., Newark 4, N. J.	545
*Electronic Specialty Co., Los Angeles 39, Calif.	169
Electronic Tube Corporation, Philadelphia 18, Penna.	170
Electrons, Incorporated, Newark 3, N. J.	935
Electro-Products, Inc., Detroit 27, Mich.	903
*Electro-Voice, Inc., Buchanan, Mich.	649
*Electro-Winders Co., Inc., Covina, Calif.	984
Elgin Metalformers Corporation, Elgin, Ill.	902
*El-Rad Manufacturing Co., Chicago 18, Ill.	632
*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.	171
Ensign Coil Company, Chicago 23, Ill.	172
Entron Inc.. Bladensburg, Md.	1058
Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.	762
Erie Resistor Corporation, Erie, Pa.	173
*ESC Corporation, Palisades Park, N. J.	1069
*Esquire Radio Corporation, Brooklyn 19, N. Y.	742
*Essex Electronics, Berkeley Heights, N. J.	425
*Essex Wire Corporation, Fort Wayne 6, Ind.	175
John E. Fast & Company, Chicago 18, Ill.	178
*Fastex Division, Illinois Tool Works, Des Plaines, Ill.	1
Ferranti Electric, Inc., New York 20, N. Y.	1040
*Filtors, Inc., Port Washington, L. I., N. Y.	977
*Fischer Electric Co., Inc., De Leon Springs, Fla.	1006
*Florida-Merit Inc., Hollywood, Fla.	987
Forbes & Wagner, Inc., Silver Creek, N. Y.	701
Foto-Video Laboratories, Inc., Cedar Grove, N. J.	963
*The Forest Electric Company, Forest Park, Ill.	773
*Foster Transformer Company, Cincinnati 23, Ohio	394
*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.	746
*Fugle-Miller Laboratories, Clark, N. J.	1003
*F. & V. Coil Winding Corporation, Newark 5, N. J.	572
*Gahagan, Inc., Esmond 17, R. I.	1057
*Gavitt Wire & Cable Co., Division of Amerace Corp., Brookfield, Mass.	360
*Gefco Manufacturing Company, Grayslake, Ill.	1056
*General Cable Corporation, Perth Amboy, N. J.	571
General Electric Company, Syracuse 1, N. Y.	188
*General Electronics, Inc., Paterson 3, N. J.	189
The General Industries Company, Elyria, Ohio	190
General Instrument Corporation, Newark 4, N. J.	191
General Magnetic Corporation, Detroit 34, Mich.	193
General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.	927

Company	Code No.
*General Precision Inc., GPL Div., Pleasantville, N. Y.	582
General Products Corporation, Union Springs, N. Y.	913
General Radio Company, West Concord, Mass.	194
General Railway Signal Company, Rochester 2, N. Y.	644
General Transistor Corporation, Jamaica 35, N. Y.	990
Glaser-Steers Corporation, Newark 4, N. J.	670
The Fred Goat Co., Inc., Brooklyn 17, N. Y.	197
Good-All Electric Mfg Co., Ogalalla, Nebr.	446
*Gordos Corporation, Bloomfield, N. J.	806
*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.	598
*Grand Coil Winders, Grand Haven, Mich.	996
*Grand Tran, Inc., Benton Harbor, Mich.	1097
*Grand Transformers, Inc., Grand Haven, Mich.	757
Grayhill, La Grange, Ill.	992
*Gray & Kuhn Inc., Roslyn Heights, N. Y.	1028
Gremar Manufacturing Co., Inc., Wakefield, Mass.	1045
The Grigsby Company, Inc., Arlington Heights, Ill.	467
The Gudeman Company, Chicago 10, Ill.	438
*Guthman Division, Essex Wire Corp., Chicago 7, Ill.	198
*The Hallicrafters Co., Chicago 24, Ill.	199
*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.	936
Hammarlund Mfg. Co., Inc., New York 1, N. Y.	201
Hardwick, Hindle, Inc., Newark 5, N. J.	411
Hawley Products Company, St. Charles, Ill.	204
Haydu Industries, Inc., Plainfield, N. J.	205
Hazeltine Corporation, Little Neck 62, N. Y.	376
*Henald Manufacturing Co. Inc., Piper City, Ill.	808
*Heppner Manufacturing Company, Round Lake, Ill.	575
*Hermetic Seal Transformer Co., Div. of S.I.E., Garland, Tex.	1072
The Hickok Electrical Instrument Co., Cleveland 8, O.	508
*Hillburn Electronic Products Co., Brooklyn 22, N. Y.	687
*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forest Hills 74, N. Y.	786
Hi-Q Division Aerovox Corporation, Olean, N. Y.	163
Hoffman Electronics Corporation, Los Angeles 7, Calif.	207
*Holiday Transformer Corporation, Chicago 14, Ill.	1038
*Holyoke Wire and Cable Corporation, Holyoke, Mass.	372
*Hopkins Engineering Company, San Fernando, Calif.	791
*Horton and Hubbard Manufacturing Co., Nashua, N. H.	1076
Huggins Laboratories, Inc., Sunnyvale, Calif.	964
Hughes Aircraft Company, Culver City, Calif.	744
Hycon Mfg. Company, Pasadena, Calif.	1007
Hy-Gain Antenna Products Company, Lincoln, Nebr.	894
Illinois Condenser Company, Chicago 22, Ill.	616
*The Indiana Steel Products Company, Valparaiso, Ind.	211
*Inductor Engineering, Inc., Lewes, Del.	915
Industrial Development Engineering Associates, Inc. Indianapolis 26, Ind.	638
*Industrial Hardware Manufacturing Co., Inc., New York 12, N. Y.	866
*Industrial Television, Inc., Clifton, N. J.	541
*Industrial Tubes, Inc., Geneva, Ill.	972
Industro Transistor Corporation, Long Island City 6, N. Y.	1053
International Electronic Industries, Inc., Nashville 1, Tenn.	911
International Electronics Corp., New York 12, N. Y.	1022
International Electronic Research Corp., Burbank, Calif.	1023
*International Instruments, Inc., West Haven, Conn.	855
International Rectifier Corporation, El Segundo, Calif.	845
International Resistance Company, Philadelphia 8, Pa.	214
International Telephone and Telegraph Corporation ITT Federal Division, Ft. Wayne, Ind.	938
ITT Federal Division, Clifton, N. J.	179
*Ion Capacitor Corp., Columbia City, Ind.	1013
Jackson Electrical Instrument Co., Dayton 2, Ohio	216
*James Vibrapowr Company, Chicago 18, Ill.	863
*JB Electronic Transformers, Inc., Chicago 47, Ill.	1093
J-B-T Instruments, Inc., New Haven 8, Conn.	442
Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.	724
*Jefferson Electric Company, Bellwood, Ill.	218
Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.	220
Jerrold Electronics Corporation, Philadelphia 32, Pa.	923
Jersey Specialty Co., Inc., Mountainview, N. J.	730
JFD Electronics, Inc., Brooklyn 4, N. Y.	221
E. F. Johnson Company, Inc., Waseca, Minn.	222
*Johnson Electric Coil Co., Franklin Park, Ill.	1096
Johnson Electronics Inc., Casselberry, Fla.	784
Kay Electric Company, Pine Brook, N. J.	620
*Kemtron Electron Products, Inc., Newburyport, Mass.	1016
Kentron Hawaii Ltd., Honolulu 14, Hawaii	1054
Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.	223
Kester Solder Company, Chicago 39, Ill.	224
*Keystone Electronics Company, Newark 4, N. J.	699
Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio	647
King Laboratories, Inc., Syracuse 3, N. Y.	225
Kip Electronics Corporation, Stamford, Conn.	593

Company	Code No.
*Kline Iron and Steel Company, Columbia, S. C.	869
*The James Knights Company, Sandwich, Ill.	504
*Kobzy Tool Company, Chicago 22, Ill.	594
Kost Products Company, Inc., Chicago 39, Ill.	951
Land-Air Inc., Chicago 31, Ill.	1099
Leach Corporation, Compton, Calif.	1024
*Lear, Inc., Santa Monica, Calif.	227
*Lectrohm, Inc., Chicago 30, Ill.	974
Lenz Electric Manufacturing Co., Chicago 47, Ill.	228
Littelfuse, Incorporated, Des Plaines, Ill.	230
Litton Industries, Beverly Hills, Calif.	879
Lowell Manufacturing Company, St. Louis 17, Mo.	657
*Lumen, Inc., Joliet, Ill.	1078
*Lytle Corporation, Chicago 1, Ill.	671
Machlett Laboratories, Inc., Sub. of Raytheon Co., Springdale, Conn.	231
The Magnavox Company, Fort Wayne 4, Ind.	232
*Magnetic Coil Manufacturing Company, Chicago 22, Ill.	933
*Magnetic Windings Division (Essex Wire Corporation), Easton, Pa.	352
P. R. Mallory & Co., Inc., Indianapolis 6, Ind.	235
*Marvel Electric Corporation, Chicago 22, Ill.	989
*Mayfair Molded Products Corporation, Schiller Park, Ill.	1041
McCoy Electronics Co., Mt. Holly Springs, Penna.	832
McGregor Electronic Industries, Inc., McGregor, Ia.	789
*McIntosh Laboratory, Inc., Binghamton, N. Y.	793
Measurements Div., McGraw-Edison Co., Boonton, N. J.	236
M.E.C., Inc., Nashville 4, Tenn.	885
*Mel-Rain Corporation, Indianapolis 3, Ind.	834
*Melrose Products, Inc., Willow Grove, Pa.	1083
Merit Coil & Transformer Corp., Hollywood, Fla.	239
Metals & Controls Div., Texas Instruments Inc., Attleboro, Mass.	1075
*Methode Manufacturing Corp., Chicago 31, Ill.	720
Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Newark 4, N. J.	240
*Microtran Company, Inc., Valley Stream, L. I., N. Y.	768
Midland Manufacturing Co., Inc., Kansas City 15, Kan.	828
*Mid-West Coil & Transformer Co., Chicago 14, Ill.	549
Midwest Speaker Company, McGregor, Iowa	993
James Millen Manufacturing Co., Inc., Malden 48, Mass.	242
Milwaukee Resistor Company, Milwaukee 4, Wis.	722
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.	1087
*Model Engineering & Manufacturing Inc., Chicago 18, Ill.	976
Moloney Electric Company, St. Louis 20, Mo.	965
Mosley Electronics, Incorporated, St. Louis 14, Mo.	750
Motorola Inc., Chicago 51, Ill.	185
Mullenbach Division of Electric Machinery Mfg. Co., Los Angeles 58, Calif.	966
Multi-Tron Laboratory, Inc., Westchester, Ill.	693
The Muter Company, Chicago 5, Ill.	244
Mycalex Corporation of America, Clifton, N. J.	642
*National Aeronautical Corporation, Fort Washington, Pa.	643
*National Company, Inc., Malden 48, Mass.	245
*National Electronics, Inc., Geneva, Ill.	749
National Semiconductor Corporation, Danbury, Conn.	1105
*National Tel-Tronics Corp., Yonkers, N. Y.	999
*National Video Corporation, Chicago 32, Ill.	836
*Newcomb Electronics Corporation, Hollywood 38, Calif.	437
North American Aviation, Inc., Los Angeles 45, Calif.	967
North American Philips Company, Inc., New York 17, N. Y.	423
Northwest Plastics, Inc., St. Paul 7, Minn.	723
Nortronics, A Div. of Northrop Aircraft, Inc., Hawthorne, Calif.	1079
*NYT Manufacturing Co., Inc., Phillisburg, N. J.	366
Oak Electronics Company, Buffalo 3, N. Y.	739
Oak Mfg. Co., Chicago 10, Ill.	249
Oaktron Electric Company, Tinley Park, Ill.	934
*Oaktron Industries Inc., Monroe, Wis.	918
*Ogden Coil & Transformer Co., Chicago 23, Ill.	776
The Ohio Carbon Company, Cleveland 11, Ohio	250
Ohmite Manufacturing Company, Skokie, Ill.	251
Olympic Products Co., Inc., Alpha 1, N. J.	740
Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.	200
Onondaga Electronics Div., Speer Carbon Co., Syracuse 1, N. Y.	848
*Ontario Industries, Inc., Hornell, N. Y.	960
Orradio Industries, Inc., Opelika, Ala.	840
*Otis Radio & Electric Corp., Hawarden, Iowa	552
*Ovenaire, Inc., Charlottesville, Va.	1100
Oxford Electric Corporation, Chicago 15, Ill.	465
*Pacific Mercury Electronics, Sepulveda, Calif.	1086
Pacific Semiconductors, Inc., Culver City, Calif.	947
Packard Bell Electronics Corp., Los Angeles 64, Calif.	254
Pan-Electronics Corporation, Griffin, Ga.	904
Parker Metal Goods Company, Worcester 8, Mass.	928
*Park Products Company, Cleveland 3, Ohio	1011

Company	Code No.
*PCA Electronics Inc., Sepulveda, Calif.	973
Penn Tran Corporation, Bellefonte, Pa.	665
Penta Laboratories, Inc., Santa Barbara, Calif.	771
*Performance Measurements Company, Detroit 35, Mich.	1094
*Phalo Plastics Corporation, Shrewsbury, Mass.	697
Philco Corporation, Philadelphia 34, Pa.	260
Philco Corporation, Accessory Division, Philadelphia, Pa.	1063
*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.	262
*Pickering and Company, Inc., Plainview, L. I., N. Y.	631
*Piezo Crystal Company, Carlisle, Pa.	501
Pilot Radio Corporation, Long Island City 1, N. Y.	264
Pioneer Electronics Corporation, Los Angeles 64, Calif.	706
*Planet Manufacturing Corporation, Bloomfield, N. J.	761
*Polan Industries, Inc., Huntington 19, W. Va.	621
Pomona Electronics Co., Inc., Pomona, Calif.	1050
Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.	505
*Precision Electronic Coil Manufacturing Co., Santa Monica, Calif.	982
Precision Electronics Inc., Franklin Park, Ill.	871
*Prodelin, Inc., Kearny, N. J.	703
*Pyramid Electric Company, North Bergen, N. J.	472
*Q. L. C. Corporation, Long Valley, N. J.	464
*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.	1005
Quam-Nichols Company, Chicago 37, Ill.	270
*Quik-Chek Corporation, Philadelphia 44, Pa.	743
Quincy Speaker Manufacturing Corp., Quincy, Ill.	767
Radio Condenser Company, Camden 3, N. J.	273
Radio Corporation of America, Camden, N. J.	274
Radio Development & Research Corp., Paterson 3, N. J.	924
Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.	276
*Radio Industries, Inc., Des Plaines, Ill.	540
Radio Materials Company, Div. P. R. Mallory & Co., Inc., Chicago 18, Ill.	732
*The Radion Corporation, Crystal Lake, Ill.	700
Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.	380
Radio Specialty Manufacturing Co., Portland 14, Oregon	587
*Radio Television Products Corp., Grass Lake, Mich.	489
RAM Electronics, Inc., Paramus, N. J.	617
Rapid Die and Molding Co., Schiller Park, Ill.	968
*Ratel, Inc., Goleta, Calif.	835
Ratigan Electronics Inc., Glendale 4, Calif.	979
The Rauland Corp., Sub. Zenith Radio Corp., Chicago 41, Ill.	1101
Raytheon Company, Waltham 54, Mass.	280
Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.	281
Red Bank Division, Bendix Aviation Corp., Eatontown, N. J.	1012
Resitron Laboratories, Inc., Santa Monica, Calif.	917
Rhein Sound Systems, Inc., New Haven 5, Conn.	952
*The R. K. Manufacturing Co., Carterville, Ill.	1089
*Rogers Electronic Corp., New York 12, N. Y.	677
The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio	285
*Rollan Electric Co., Chicago 20, Ill.	721
*Rowe Industries, Toledo 9, Ohio	580
*Russell Speaker Company, Chicago 21, Ill.	748
S & A Electronics, Inc., Toledo 5, Ohio	872
*Sampson Electric Products Co., Clinton, N. C.	518
San Fernando Electric Mfg. Co., San Fernando, Calif.	815
Sangamo Electric Company, Electronic Components Division, Springfield, Ill.	658
*Sarkes Tarzian, Inc., Bloomington, Ind.	684
Schneider & Marquard, Inc., Newton, N. J.	520
*Schulmerich Carillons, Inc., Sellersville, Penna.	428
*Schwalm Electronics, Inc., Highland Park, Ill.	1060
*Scientific Components, Inc., Santa Barbara, Calif.	475
Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.	291
Sheffco Mfg. Corp., Fairview, N. J.	698
*Sherold Crystals Inc., Kansas City 8, Mo.	975
*Sherron Electronics Company, Brooklyn 37, N. Y.	293
Shurite Meters (J-B-T Instruments, Inc.), New Haven 8, Conn.	484
F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.	294
Simpson Electric Company, Chicago 44, Ill.	614
Skiatron Electronics & Television Corp., New York 14. N. Y.	931
*Paul Smith, Inc., Cincinnati 9, Ohio	1070
SNC Manufacturing Co., Inc., Oshkosh, Wis.	1080
*Solar Manufacturing Corporation, Los Angeles 58, Calif.	296
*Sonotone Corporation, Elmsford, N. Y.	787
Soundolier, Inc., St. Louis 22, Mo.	1026
*Southern Electronics Company, Greeneville, Tenn.	891
*South Haven Coil, Inc., South Haven, Mich.	1066
*Sparton Electronics, Division of Sparton Corporation, Jackson Mich.	299

Company	Code No.
Speer Resistor Division, Speer Carbon Company, Bradford, Penna.	300
*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.	782
Sprague Electric Company, North Adams, Mass.	303
Sprague of Wisconsin, Inc., Grafton, Wis.	457
Stackpole Carbon Company, St. Marys 3, Pa.	304
*Standard Coil Products Co. Inc., Melrose Park, Ill.	305
*Standard Condenser Corp., Chicago 13, Ill.	710
*Standard Crystal Company, Kansas City 8, Mo.	995
*Standard Electrical Products Co., Dayton 3, Ohio	668
*Standard Electromagnetics Inc., Frederick, Md.	1077
Standard Electronics, Division of Radio Engineering Labs., Inc., Long Island City 1, N. Y.	694
Standard Television Tube Corp., New Orleans 19, La.	922
*Standard Winding Company, Newburgh, N. Y.	550
The Staver Company Incorporated, Bay Shore, L. I., N. Y.	604
Stone City Products Co., Bedford. Ind.	770
Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.	308
*Sun Capacitors, Chicago 25, Ill.	1061
*Supreme Transformer Corporation, Chicago 39, Ill.	798
Surprenant Mfg. Co., Boston 8, Mass.	624
Switchcraft, Inc., Chicago 30, Ill.	1000
Sylvania Electric Products Inc., New York 19, N. Y.	312
*Symphonic Electronic Corp., New Brunswick, N. J.	351
Syncro Corporation, Electronics Div., Hicksville, Ohio	1081
*Syntronic Instruments, Inc., Addison, Ill.	822
Talk-A-Phone Co., Chicago 23, Ill.	132
Tansitor Electronics, Inc., Bennington, Vt.	988
*Tech-Master Corporation, Brooklyn 1, N. Y.	679
Technical Training Institute, Portland 11, Ore.	921
*Technitrol Engineering Company, Philadelphia 34, Pa.	1102
Telechrome Mfg. Corp., Amityville, N. Y.	868
*Telectron Company, Fort Lauderdale, Fla.	1091
Tele-Dynamics Inc., Philadelphia 31, Pa.	1095
*Telemeter Magnetics, Inc., Los Angeles 64, Calif.	887
*Telequip Radio Company, Chicago 8, Ill.	454
*Teleradio Engineering Corporation, Wilkes Barre, Pa.	357
*TELvision Laboratories, Inc., Wauconda, Ill.	608
Temco Aircraft Corporation, Dallas 22, Tex.	1065
*Tempel Steel Company, Chicago 26, Ill.	745
Texas Instruments Incorporated, Dallas 9, Tex.	980
*Thomas & Skinner Inc., Indianapolis 7, Ind.	318
Thomas Electronics, Inc., Passaic, N. J.	672
*Thordarson-Meissner, Mt. Carmel, Ill.	238
*Todd Electric Company, Inc., Yonkers, N. Y.	926
*B. J. Toegel, Inc., Plainfield, N. J.	548
*Topic Incorporated, Natick, Mass.	1098
*Torwico Electronics, Inc., Union, N. J.	1025
*Transcon Manufacturing Co., Dallas 9, Tex.	1084
*Transformer Manufacturers, Inc., Chicago 30, Ill.	1052
*Transitron Electronic Corporation, Wakefield, Mass.	959
Translite Electronics Corp., Chicago 39, Ill.	810
Trav-Ler Radio Corporation, Chicago 6, Ill.	320
Tresco, Inc., Philadelphia 28, Penna.	897
Triad Transformer Corporation, Venice, Calif.	830
Triplett Electrical Instrument Co., Bluffton, Ohio	321
*Tritron Company, Milwaukee 12, Wis.	1085
*Triwec-Transformer Company, Chicago 18, Ill.	524
Tung-Sol Electric Inc., Newark 4, N. J.	322
*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.	1073
Union City Filament Corp., Union City, N. J.	954
*Union Electric & Manufacturing Co., Jersey City 7, N. J.	804
United Condenser Corporation, New York 56, N. Y.	516
United Electronics Company, Newark 4, N. J.	323
*United Electronic Manufacturing Corp., Union City, N. J.	820
*United States Radium Corporation, Morristown, N. J.	324
United Transformer Corporation, New York 13, N. Y.	418
*Utah Radio Products Corp., Huntington, Ind.	328
*Utrad Corporation, Huntington, Ind.	1036
Valpey Crystal Corporation, Holliston, Mass.	527
Varian Associates, Palo Alto, Calif.	809
Vector Electronic Company, Inc., Glendale, Calif.	971
Vector Electronic Company, Glendale, Calif.	971
Vidaire Electronics Mfg. Corp., Baldwin, N. Y.	797
*Videocraft Manufacturing Co., Chicago 39, Ill.	824
*Viking Industries, Inc., Canoga Park, Calif.	896
Vitramon, Inc., Bridgeport 1, Conn.	956
*V-M Corporation, Benton Harbor, Mich.	857
*Vokar Products, Inc., Ann Arbor, Mich.	168
Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.	507
*Ward Leonard Electric Co., Mount Vernon, N. Y.	532
Warwick Manufacturing Corporation, Chicago 48, Ill.	332
Waterman Products Company, Inc., Philadelphia 25, Pa.	431
Waters Conley Company, Inc., Rochester, Minn.	382
*WEBCOR, Inc., Chicago 39, Ill.	375
*Wells Electronics Company, South Bend 23, Ind.	1074
Wells-Gardner & Co., Chicago 39, Ill.	334
Wm. H. Welsh Co., Inc., Chicago 16, Ill.	335
*Wesco Electrical Co., Inc., Greenfield, Mass.	1067
Western Electric Company, Inc., New York 5, N. Y.	336
Westinghouse Electric Corporation, Baltimore 3, Md.	337
Westinghouse Electric Corp., Director Systems Dept., Pittsburgh 6, Pa.	1090
Weston Instruments, Div. of Daystrom, Inc., Newark 12, N. J.	338
*Wheeler Electronic Corporation, Waterbury 20, Conn.	392
Wheeler Laboratories, Inc., Sub., Hazeltine, Corp., Great Neck, N. Y.	529
*Whitewater Electronics Inc., Whitewater, Wis.	758
*Wilcox Electric Company, Inc., Kansas City 27, Mo.	339
*Winchester Electronics, Inc., Norwalk, Conn.	1082
Winston Electronics, Div. Jetronic Industries, Miami 42, Fla.	957
*Wirco Electronics, Inc., El Monte, Calif.	1049
*Wirt Company, Philadelphia 44, Penna.	406
*Woodward-Schumacher Electric Corp., Chicago 22, Ill.	608
*Worthco Corporation, Beverly Hills, Calif.	785
Wright Zimmerman, Inc., New Brighton, Minn.	683
*The Wurlitzer Company, Corinth, Miss.	1107
*Yardney Electric Corp., New York 13, N. Y.	1108
*The Zell Products Corp., Norwalk, Conn.	342
Zenith Radio Corporation, Chicago 39, Ill.	343
Z & W Mfg. Corp., Wickliffe, Ohio	819

NUMERICAL LIST

EIA Production Source Code Symbols

(* Indicates non-members)

Code No.	Company
1	*Fastex Division, Illinois Tool Works, Des Plaines, Ill.
101	*Admiral Corporation, Chicago 47, Ill.
102	Aerovox Corporation, New Bedford, Mass.
106	Allen-Bradley Company, Milwaukee 4, Wis.
107	The Alliance Manufacturing Co., Inc., Alliance, Ohio
110	All Star Products, Inc., Defiance, Ohio
111	Amperex Electronic Corporation, Hicksville, L. I., N. Y.
113	*Andrea Radio Corporation, Long Island City 1, N. Y.
115	A. R. F. Products, Inc., River Forest, Ill.
116	The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.
119	Automatic Manufacturing Division, General Instrument Corp., Newark 4, N. J.
120	*Automatic Radio Mfg. Co., Inc., Boston 15, Mass.
122	The Bead Chain Manufacturing Co., Bridgeport 5, Conn.
125	Bendix Radio, Division of Bendix Aviation Corporation, Baltimore 4, Md.
128	Bliley Electric Company, Erie, Pa.
132	Talk-A-Phone Co., Chicago 23, Ill.
133	C. F. Cannon Co., Springwater, N. Y.
134	Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.
135	Chicago Condenser Corporation, Chicago 47, Ill.
137	Chicago Telephone Supply Corp., Elkhart, Ind.
138	*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.
139	Cinch Manufacturing Company, Chicago 24, Ill.
140	Clarostat Mfg. Co., Inc., Dover, New Hampshire
141	*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.
145	*Cinaudagraph Inc., Chicago 26, Ill.
146	Continental Carbon, Div. of Wirt Company, Philadelphia 44, Pa.
148	Corning Glass Works, Corning, N. Y.
149	Cornish Wire Company, Inc., New York 7, N. Y.
151	Croname, Incorporated, Chicago 48, Ill.
152	Crosley Division, Avco Corp., Cincinnati 25, Ohio
155	*DeWald, Div. of United Scientific Labs., Inc., Long Island City 1, N. Y.
156	Wilbur B. Driver Company, Newark 4, N. J.
158	Allen B. DuMont Laboratories, Inc., Electronic Tube Div., Clifton, N. J.
159	*DX Radio Products Company, Inc., Chicago 47, Ill.
160	*Hugh H. Eby Company, Philadelphia 44, Penna.
162	Eitel-McCullough, Inc., San Carlos, Calif.
163	Hi-Q Division Aerovox Corporation, Olean, N. Y.
164	The Electro Motive Mfg. Co., Inc., Willimantic, Conn.
166	*Chicago Electronic Engineering Co., Chicago 47, Ill.
168	*Vokar Products, Inc., Ann Arbor, Mich.
169	*Electronic Specialty Co., Los Angeles 39, Calif.
170	Electronic Tube Corporation, Philadelphia 18, Pa.
171	*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.
172	Ensign Coil Company, Chicago 23, Ill.
173	Erie Resistor Corporation, Erie, Pa.
175	*Essex Wire Corporation, Fort Wayne 6, Ind.
178	John E. Fast & Company, Chicago 18, Ill.

Code No.	Company
179	ITT Federal Division, Clifton, N. J.
185	Motorola Inc., Chicago 51, Ill.
188	General Electric Company, Syracuse 1, N. Y.
189	*General Electronics, Inc., Paterson 3, N. J.
190	The General Industries Company, Elyria, Ohio
191	General Instrument Corporation, Newark 4, N. J.
193	General Magnetic Corporation, Detroit 34, Mich.
194	General Radio Company, West Concord, Mass.
197	The Fred Goat Co., Inc., Brooklyn 17, N. Y.
198	*Guthman Division, Essex Wire Corp., Chicago 7, Ill.
199	*The Hallicrafters Company, Chicago 24, Ill.
200	Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.
201	Hammarlund Mfg. Co., Inc., New York 1, N. Y.
204	Hawley Products Company, St. Charles, Ill.
205	Ha-du Industries, Inc., Plainfield, N. J.
207	Herman Electronics Corporation, Los Angeles 7, Calif.
210	CBS Electronics, Division of Columbia Broadcasting System, Inc., Danvers, Mass.
211	*The Indiana Steel Products Company, Valparaiso, Ind.
214	International Resistance Company, Philadelphia 8, Pa.
216	Jackson Electrical Instrument Co., Dayton 2, Ohio
218	*Jefferson Electric Company, Bellwood, Ill.
220	Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.
221	JFD Electronics, Inc., Brooklyn 4, N. Y.
222	E. F. Johnson Company, Inc., Waseca, Minn.
223	Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.
224	Kester Solder Company, Chicago 39, Ill.
225	King Laboratories, Inc., Syracuse 3, N. Y.
227	*Lear, Inc., Santa Monica, Calif.
228	Lenz Electric Manufacturing Co., Chicago 47, Ill.
230	Littelfuse, Incorporated, Des Plaines, Ill.
231	Machlett Laboratories, Inc., Sub. of Raytheon Co., Springdale, Conn.
232	The Magnavox Company, Fort Wayne 4, Ind.
235	P. R. Mallory & Co., Inc., Indianapolis 6, Ind.
236	Measurements Div., McGraw-Edison Co., Boonton, N. J.
238	*Thordarson-Meissner, Mt. Carmel, Ill.
239	Merit Coil & Transformer Corp., Hollywood, Fla.
240	Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Newark 4, N. J.
242	James Millen Manufacturing Co., Inc., Malden 48, Mass.
244	The Muter Company, Chicago 5, Ill.
245	*National Company, Inc., Malden 48, Mass.
248	Arvin Industries, Inc., Columbus, Ind.
249	Oak Mfg. Co., Chicago 10, Ill.
250	The Ohio Carbon Company, Cleveland 11, Ohio
251	Ohmite Manufacturing Company, Skokie, Ill.
252	DuKane Corporation, St. Charles, Ill.
254	Packard Bell Electronics Corp., Los Angeles 64, Calif.
260	Philco Corporation, Philadelphia 34, Pa.
262	*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.
264	Pilot Radio Corporation, Long Island City 1, N. Y.
270	Quam-Nichols Company, Chicago 37, Ill.
273	Radio Condenser Company, Camden 3, N. J.
274	Radio Corporation of America, Camden, N. J.
276	Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.
280	Raytheon Company, Waltham 54, Mass.
281	Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.
285	The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio
286	Advance Ross Electronics Corp., Chicago 45, Ill.
291	Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.
293	*Sherron Electronics Company, Brooklyn 37, N. Y.
294	F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.
296	*Solar Manufacturing Corporation, Los Angeles 58, Calif.
299	*Sparton Electronics, Division of Sparton Corporation, Jackson, Mich.
300	Speer Resistor Division, Speer Carbon Company, Bradford, Pa.
303	Sprague Electric Company, North Adams, Mass.
304	Stackpole Carbon Company, St. Marys 3, Pa.
305	*Standard Coil Products Co. Inc., Melrose Park, Ill.
308	Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.
312	Sylvania Electric Products Inc., New York 19, N. Y.
318	*Thomas & Skinner, Inc., Indianapolis 7, Ind.
320	Trav-Ler Radio Corporation, Chicago 6, Ill.
321	Triplett Electrical Instrument Co., Bluffton, Ohio
322	Tung-Sol Electric Inc., Newark 4, N. J.
323	United Electronics Company, Newark 4, N. J.
324	*United States Radium Corporation, Morristown, N. J.
328	*Utah Radio Products Corp., Huntington, Ind.
332	Warwick Manufacturing Corporation, Chicago 48, Ill.
334	Wells-Gardner & Co., Chicago 39, Ill.

Code No.	Company
335	Wm. H. Welsh Co., Inc., Chicago 16, Ill.
336	Western Electric Company, Inc., New York 5, N. Y.
337	Westinghouse Electric Corporation, Baltimore 3, Md.
338	Weston Instruments, Div. of Daystrom, Inc., Newark 12, N. J.
339	*Wilcox Electric Company, Inc., Kansas City 27, Mo.
342	*The Zell Products Corp., Norwalk, Conn.
343	Zenith Radio Corporation, Chicago 39, Ill.
351	*Symphonic Electronic Corp., New Brunswick, N. J.
352	*Magnetic Windings Division, Essex Wire Corporation, Easton, Penna.
357	*Teleradio Engineering Corporation, Wilkes Barre, Pa.
360	*Gavitt Wire & Cable Co., Division of Amerace Corp., Brookfield, Mass.
366	*NYT Manufacturing Co., Inc., Phillisburg, N. J.
371	*Best Manufacturing Co., Inc., Irvington 11, N. J.
372	*Holyoke Wire and Cable Corporation, Holyoke, Mass.
375	*WEBCOR, Inc., Chicago 39, Ill.
376	Hazeltine Corporation, Little Neck, 62, N. Y.
380	Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.
382	Waters Conley Company, Inc., Rochester, Minn.
385	*Dearborn Glass Company, Bedford Park, Ill.
391	Altec Lansing Corporation, Anaheim, Calif.
392	*Wheeler Electronic Corporation, Waterbury 20, Conn.
394	*Foster Transformer Company, Cincinnati 23, Ohio
402	Andrew Corporation, Chicago 19, Ill.
406	*Wirt Company, Philadelphia 44, Penna.
409	British Industries Corporation, Port Washington, L. I., N. Y.
411	Hardwick, Hindle, Inc., Newark 5, N. J.
413	*Acme Electric Corporation, Cuba, N. Y.
418	United Transformer Corporation, New York 13, N. Y.
423	North American Philips Company, Inc., New York 17, N. Y.
425	*Essex Electronics, Berkeley Heights, N. J.
427	*Communication Measurements Laboratory, Inc., Plainfield, N. J.
428	*Schulmerich Carillons, Inc., Sellersville, Penna.
431	Waterman Products Company, Inc., Philadelphia 25, Pa.
433	*Cleveland Electronics, Inc., Cleveland 3, Ohio
437	*Newcomb Electronics Corporation, Hollywood 38, Calif.
438	The Gudeman Company, Chicago 10, Ill.
439	Collins Radio Company, Cedar Rapids, Ia.
442	J-B-T Instruments, Inc., New Haven 8, Conn.
446	Good-All Electric Mfg. Co., Ogallala, Nebr.
450	*Columbus Process Co., Inc., Columbus, Ind.
454	*Telequip Radio Company, Chicago 8, Ill.
457	Sprague of Wisconsin, Inc., Grafton, Wis.
461	Barker & Williamson, Inc., Bristol, Penna.
464	*Q. L. C. Corporation, Long Valley, N. J.
465	Oxford Electric Corporation, Chicago 15, Ill.
466	Delco Radio Division, General Motors Corporation, Kokomo, Ind.
467	The Grigsby Company, Inc., Arlington Heights, Ill.
472	*Pyramid Electric Company, North Bergen, N. J.
475	*Scientific Components, Inc., Santa Barbara, Calif.
484	Shurite Meters (J-B-T Instruments, Inc.), New Haven 8, Conn.
489	*Radio Television Products Corp., Grass Lake, Mich.
501	*Piezo Crystal Company, Carlisle, Pa.
503	Caledonia Electronics & Transformer Corp., Caledonia, N. Y.
504	*The James Knights Company, Sandwich, Ill.
505	Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.
507	Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.
508	The Hickok Electrical Instrument Co., Cleveland 8, O.
515	*Electronic Components Corporation, Chicago 8, Ill.
516	United Condenser Corporation, New York 56, N. Y.
518	*Sampson Electric Products Co., Clinton, N. C.
520	Schneider & Marquard, Inc., Newton, N. J.
524	*Triwec Transformer Company, Chicago 18, Ill.
527	Valpey Crystal Corporation, Holliston, Mass.
529	Wheeler Laboratories, Inc., Sub., Hazeltine Corp., Great Neck, N. Y.
530	*Clippard Instrument Laboratory, Inc., Cincinnati 39, Ohio
532	*Ward Leonard Electric Co., Mount Vernon, N. Y.
540	*Radio Industries, Inc., Des Plaines, Ill.
541	*Industrial Television, Inc., Clifton, N. J.
545	*Electronic Enterprises, Inc., Newark 4, N. J.
547	*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.
548	*B. J. Toegel, Inc., Plainfield, N. J.
549	*Mid-West Coil & Transformer Co., Chicago 14, Ill.
550	*Standard Winding Company, Newburgh, N. Y.
551	American Television & Radio Co., St. Paul 1, Minn.
552	*Otis Radio & Electric Corp., Hawarden, Iowa
554	Amphenol-Borg Electronics Corp., Broadview, Ill.
563	J. W. Davis & Company, Dallas 35, Texas
569	*Electrical Utilities Company, La Salle, Ill.

Code No.	Company
571	*General Cable Corporation, Perth Amboy, N. J.
572	*F. & V. Coil Winding Corporation, Newark 5, N. J.
573	Alcon Metal Products, Inc., Chicago 47, Ill.
575	*Heppner Manufacturing Company, Round Lake, Ill.
579	Belden Manufacturing Company, Chicago 44, Ill.
580	*Rowe Industries, Toledo 9, Ohio
582	*General Precision Inc., GPL Division, Pleasantville, N. Y.
586	Drake Manufacturing Company, Chicago 31, Ill.
587	Radio Specialty Manufacturing Co., Portland 14, Ore.
588	Barnes Metal Products Company, Chicago 23, Ill.
589	Bogen-Presto Division, The Siegler Corp., Paramus, N. J.
593	Kip Electronics Corporation, Stamford, Conn.
594	*Kobzy Tool Company, Chicago 22, Ill.
598	*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.
599	*Elco Corporation, Philadelphia 24, Penna.
604	The Staver Company Incorporated, Bay Shore, L. I., N. Y.
606	*Woodward-Schumacher Electric Corp., Chicago 22, Ill.
607	Consolidated Wire & Associated Companies, Chicago 16, Ill.
608	*TELvision Laboratories, Inc., Wauconda, Ill.
610	Carter Parts Company, Skokie, Ill.
614	Simpson Electric Company, Chicago 44, Ill.
616	Illinois Condenser Company, Chicago 22, Ill.
617	RAM Electronics, Inc., Paramus, N. J.
620	Kay Electric Company, Pine Brook, N. J.
621	*Polan Industries, Inc., Huntington 19, W. Va.
624	Surprenant Mfg. Co., Boston 8, Mass.
628	*Davis Electric Company, Cape Girardeau, Mo.
631	*Pickering and Company, Inc., Plainview, L. I., N. Y.
632	*El-Rad Manufacturing Co., Chicago 18, Ill.
637	*Central Coil Company, Indianapolis 22, Ind.
638	Industrial Development Engineering Associates, Inc., Indianapolis 26, Ind.
642	Mycalex Corporation of America, Clifton, N. J.
643	*National Aeronautical Corporation, Fort Washington, Pa.
644	General Railway Signal Company, Rochester 2, N. Y.
647	Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio
648	*American Radionic Co., Inc., Danbury, Conn.
649	*Electro-Voice, Inc., Buchanan, Mich.
657	Lowell Manufacturing Company, St. Louis 17, Mo.
658	Sangamo Electric Company, Electronic Components Division, Springfield, Ill.
665	Penn Tran Corporation, Bellefonte, Penna.
668	*Standard Electrical Products Co., Dayton, 3, Ohio
670	Glaser-Steers Corporation, Newark 4, N. J.
671	*Lytle Corporation, Chicago 1, Ill.
672	Thomas Electronics, Inc., Passaic, N. J.
677	*Rogers Electronic Corp., New York 12, N. Y.
679	*Tech-Master Corporation, Brooklyn 1, N. Y.
680	Conrac Incorporated, Glendora, Calif.
681	*American Lava Corporation, Chattanooga 5, Tenn.
682	*Electrical Windings, Inc., Chicago 39, Ill.
683	Wright Zimmerman, Inc., New Brighton, Minn.
684	*Sarkes Tarzian, Inc., Bloomington, Ind.
687	*Hillburn Electronic Products Co., Brooklyn 22, N. Y.
689	Aladdin Electronics, a Division of Aladdin Industries, Incorporated, Nashville 10, Tenn.
692	CELCO (Constantine Engineering Laboratories Co.), Mahwah, N. J.
693	Multi-Tron Laboratory, Inc., Westchester, Ill.
694	Standard Electronics, Division of Radio Engineering Labs., Inc., Long Island City 1, N. Y.
695	Basler Electric Company, Highland, Ill.
697	*Phalo Plastics Corporation, Shrewsbury, Mass.
698	Sheffco Mfg. Corp., Fairview, N. J.
699	*Keystone Electronics Company, Newark 4, N. J.
700	*The Radion Corporation, Crystal Lake, Ill.
701	Forbes & Wagner, Inc., Silver Creek, N. Y.
703	*Prodelin, Inc., Kearny, N. J.
704	Cosmic Radio Corporation, New York 59, N. Y.
705	*Ajax Condenser Co., Inc., Chicago 14, Ill.
706	Pioneer Electronics Corporation, Los Angeles 64, Calif.
710	*Standard Condenser Corp., Chicago 13, Ill.
711	*Controls Company of America, Schiller Park, Ill.
719	*Carbonneau Industries, Grand Rapids 2, Mich.
720	*Methode Manufacturing Corp., Chicago 31, Ill.
721	*Rollan Electric Co., Chicago 20, Ill.
722	Milwaukee Resistor Co., Milwaukee 4, Wis.
723	Northwest Plastics, Inc., St. Paul 7, Minn.
724	Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.
730	Jersey Specialty Co., Inc., Mountainview, N. J.
732	Radio Materials Company, Div. P. R. Mallory & Co., Inc., Chicago 18, Ill.
733	Alpha Metals, Inc., Jersey City 4, N. J.
739	Oak Electronics Company, Buffalo 3, N. Y.
740	Olympic Products Co., Inc., Alpha 1, N. J.
742	*Esquire Radio Corporation, Brooklyn 19, N. Y.
743	*Quik-Chek Corporation, Philadelphia 44, Pa.

Code No.	Company
744	Hughes Aircraft Company, Culver City, Calif.
745	*Tempel Steel Company, Chicago 26, Ill.
746	*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.
748	*Russell Speaker Company, Chicago 21, Ill.
749	*National Electronics, Incorporated, Geneva, Ill.
750	Mosley Electronics, Incorporated, St. Louis 14, Mo.
752	*Electronic Devices, Inc., Brooklyn 15, N. Y.
757	*Grand Transformers, Inc., Grand Haven, Mich.
758	*Whitewater Electronics Inc., Whitewater, Wis.
761	*Planet Manufacturing Corp., Bloomfield, N. J.
762	Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.
767	Quincy Speaker Manufacturing Corp., Quincy, Ill.
768	*Microtran Company, Inc., Valley Stream, L. I., N. Y
770	Stone City Products Co., Bedford, Ind.
771	Penta Laboratories, Inc., Santa Barbara, Calif.
773	*The Forest Electric Company, Forest Park, Ill.
776	*Ogden Coil & Transformer Co., Chicago 23, Ill.
780	*DeJur-Amsco Corporation, Long Island City, N. Y.
782	*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.
783	Eldico Electronics, Division of Radio Engineering Laboratories, Inc., Long Island City, N. Y.
784	Johnson Electronics Inc., Casselberry, Fla.
785	*Worthco Corporation, Beverly Hills, Calif.
786	*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forrest Hills 74, N. Y.
787	*Sonotone Corporation, Elmsford, N. Y.
789	McGregor Electronic Industries, Inc., McGregor, Ia.
791	*Hopkins Engineering Company, San Fernando, Calif.
792	Atlantic Wire & Cable Corp., College Point 56, N. Y.
793	*McIntosh Laboratory, Inc., Binghamton, N. Y.
797	Vidaire Electronics Mfg. Corp., Baldwin, N. Y.
798	*Supreme Transformer Corporation, Chicago 39, Ill.
804	*Union Electric & Manufacturing Company, Jersey City 7, N. J.
806	*Gordos Corporation, Bloomfield, N. J.
808	*Henald Manufacturing Co. Inc., Piper City, Ill.
809	Varian Associates, Palo Alto, Calif.
810	Translite Electronics Corp., Chicago 39, Ill.
812	*Bradley Semiconductor Corporation, New Haven 11, Conn.
813	Adler Electronics Inc., New Rochelle, N. Y.
815	San Fernando Electric Mfg. Co., San Fernando, Calif.
816	Dale Products, Inc., Columbus, Nebr.
817	Brubaker Electronics, Inc., Culver City, Calif.
819	Z & W Mfg. Corp., Wickliffe, Ohio
820	*United Electronic Manufacturing Corp., Union City, N. J.
822	*Syntronic Instruments, Inc., Addison, Ill.
824	*Videocraft Manufacturing Co., Chicago 39, Ill.
828	Midland Manufacturing Co., Inc., Kansas City 15, Kan.
830	Triad Transformer Corporation, Venice, Calif.
831	*Better Coil & Transformer Corp., Goodland, Ind.
832	McCoy Electronics Co., Mt. Holly Springs, Penna.
834	*Mel-Rain Corporation, Indianapolis 3, Ind.
835	*Ratel, Inc., Goleta, Calif.
836	*National Video Corporation, Chicago 32, Ill.
837	*Carol Electronics Corporation, Martinsburg, W. Va.
840	Orradio Industries, Inc., Opelika, Ala.
841	Central Electronic Manufacturers, Denville, N. J.
845	International Rectifier Corporation, El Segundo, Calif.
848	Onondaga Electronics Div., Speer Carbon Co. Syracuse 1, N. Y.
851	R. L. Drake Company, Miamisburg, Ohio
852	Andrews Tower, Inc., Fort Worth 19, Tex.
855	*International Instruments Inc., West Haven, Conn.
856	Clevite Transistor Products, Waltham 54, Mass.
857	*V-M Corporation, Benton Harbor, Mich.
863	*James Vibrapowr Company, Chicago 18, Ill.
866	*Industrial Hardware Manufacturing Co., Inc., New York 12, N. Y.
867	C-B-C Electronics Co., Inc., Philadelphia 20, Pa.
868	Telechrome Mfg. Corp., Amityville, N. Y.
869	*Kline Iron and Steel Company, Columbia, S. C.
870	Cubic Corporation, San Diego 11, Calif.
871	Precision Electronics Inc., Franklin Park, Ill.
872	S & A Electronics, Inc., Toledo 5, Ohio
878	*Acro Products Company, Philadelphia 28, Penna.
879	Litton Industries, Beverly Hills, Calif.
883	*Albergo Transformer Company, Chicago 22, Ill.
885	M.E.C., Inc., Nashville 4, Tenn.
886	Calvideo Tube Corporation, Compton, Calif.
887	*Telemeter Magnetics, Inc., Los Angeles 64, Calif.
888	Connector Corporation, Chicago 30, Ill.
891	*Southern Electronics Company, Greeneville, Tenn.
892	*American Transformer Corp., Chicago 7, Ill.
893	Armel Electronics Inc., Brooklyn 32, N. Y.
894	Hy-Gain Antenna Products Company, Lincoln, Nebr.
895	*Dinion Coil Co., Inc., Caledonia, N. Y.
896	*Viking Industries, Inc., Canoga Park, Calif.
897	Tresco, Inc., Philadelphia 28, Penna.
898	Convair/Pomona, Div. of General Dynamics Corp., Pomona, Calif.

Code No.	Company
900	ACF Electronics, Division of ACF Industries, Inc. Alexandria, Va.
901	*Cargo Packers, Inc., Glendale 27, N. Y.
902	Elgin Metalformers Corporation, Elgin, Ill.
903	Electro-Products, Inc., Detroit 27, Mich.
904	Pan-Electronics Corporation, Griffin, Ga.
906	*Coilcraft, Incorporated, Cary, Ill.
909	*Chester Cable Corp., Chester, N. Y.
910	*Aerolite Electronics Corp., Union City, N. J.
911	International Electronic Industries, Inc., Nashville 1, Tenn.
912	*Blackburn Electronic Corporation, Wyoming, Pa.
913	General Products Corporation, Union Springs, N. Y.
915	*Inductor Engineering, Inc., Lewes, Del.
917	Resitron Laboratories, Inc., Los Angeles 25, Calif.
918	*Oaktron Industries Inc., Monroe, Wis.
920	The Antenna Specialists Co., Cleveland 6, Ohio
921	Technical Training Institute, Portland 11, Ore.
922	Standard Television Tube Corp., New Orleans 19, La.
923	Jerrold Electronics Corporation, Philadelphia 32, Pa.
924	Radio Development & Research Corp., Paterson 3, N. J.
926	*Todd Electric Company, Inc., Yonkers, N. Y.
927	General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.
928	*Acme Coil & Transformer Corp., Chicago 14, Ill.
929	Parker Metal Goods Company, Worcester 8, Mass.
931	Skiatron Electronics & Television Corp., New York 14, N. Y.
933	*Magnetic Coil Manufacturing Company, Chicago 22, Ill.
934	*Oaktron Electric Company, Tinley Park, Ill.
935	Electrons, Incorporated, Newark 3, N. J.
936	*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.
938	ITT Federal Division, Fort Wayne, Ind.
940	Bomac Laboratories, Inc., Beverly, Mass.
941	*Electronic Engineering Company of California, Santa Ana, Calif.
947	Pacific Semiconductors, Inc., Culver City, Calif.
949	*Apex Coil and Transformer Corporation, Chicago 8, Ill.
951	Kost Products Company, Inc., Chicago 39, Ill.
952	Rhein Sound Systems, Inc., New Haven 5, Conn.
954	Union City Filament Corp., Union City, N. J.
956	Vitramon, Inc., Bridgeport 1, Conn.
957	Winston Electronics, Div. Jetronic Industries, Miami 42, Fla.
959	*Transitron Electronic Corporation, Wakefield, Mass.
960	*Ontario Industries, Inc., Hornell, N. Y.
961	Anton Electronic Laboratories, Inc., Brooklyn 37, N. Y.
963	Foto-Video Laboratories, Inc., Cedar Grove, N. J.
964	Huggins Laboratories, Inc., Sunnyvale, Calif.
965	Moloney Electric Company, St. Louis 20, Mo.
966	Mullenbach Division of Electric Machinery Mfg. Co., Los Angeles 58, Calif.
967	North American Aviation, Inc., Los Angeles 45, Calif.
968	Rapid Die and Molding Co., Schiller Park, Ill.
971	Vector Electronic Company, Inc., Glendale, Calif.
972	*Industrial Tubes, Inc., Geneva, Ill.
973	*PCA Electronics Inc., Sepulveda, Calif.
974	*Lectrohm, Inc., Chicago 30, Ill.
975	*Sherold Crystals Inc., Kansas City 8, Mo.
976	*Model Engineering & Manufacturing, Inc., Chicago 18, Ill.
977	*Filtors, Inc., Port Washington, L. I., N. Y.
978	American Electronics Company, Mineola, L. I., N. Y.
979	Ratigan Electronics Inc., Glendale 4, Calif.
980	Texas Instruments Incorporated, Dallas 9, Tex.
982	*Precision Electronic Coil Manufacturing Company, Santa Monica, Calif.
984	*Electro-Winders Co., Inc., Covina, Calif.
985	*Bartlett Manufacturing Company, Glenview, Ill.
987	*Florida-Merit Inc., Hollywood, Fla.
988	Tansitor Electronics, Inc., Bennington, Vt.
989	*Marvel Electric Corporation, Chicago 22, Ill.
990	General Transistor Corporation, Jamaica 35, N. Y.
992	Grayhill, La Grange, Ill.
993	Midwest Speaker Company, McGregor, Iowa
994	Eberline Instrument Corporation, Santa Fe, N. M.
995	*Standard Crystal Company, Kansas City 8, Mo.
996	*Grand Coil Winders, Grand Haven, Mich.
999	*National Tel-Tronics Corp., Yonkers, N. Y.
1000	Switchcraft, Inc., Chicago 30, Ill.
1002	*The Amplifone Corporation, Chicago 40, Ill.
1003	*Fugle-Miller Laboratories, Clark, N. J.
1005	*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.
1006	*Fischer Electric Co., Inc., De Leon Springs, Fla.
1007	Hycon Mfg. Company, Pasadena, Calif.
1011	*Park Products Company, Cleveland 3, Ohio
1012	Red Bank Division, Bendix Aviation Corp., Long Branch, N. J.
1013	*Ion Capacitor Corp., Columbia City, Ind.
1016	*Kemtron Electron Products, Inc., Newburyport, Mass.
1017	Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.
1019	Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.
1022	International Electronics Corp., New York 12, N. Y.
1023	International Electronic Research Corp., Burbank, Calif.
1024	Leach Corporation, Compton, Calif.
1025	*Torwico Electronics, Inc., Union, N. J.
1026	Soundolier, Inc., St. Louis 22, Mo.
1028	*Gray & Kuhn, Inc., Roslyn Heights, N. Y.
1030	*ACDC Electronics, Inc., Burbank, Calif.
1031	*A.L.A. Industries, Inc., Harrison, N. Y.
1033	*Electro Engineering Works, San Leandro, Calif.
1035	*Associated Transformer Corp., Chicago 47, Ill.
1036	*Utrad Corporation, Huntington, Ind.
1038	*Holiday Transformer Corporation, Chicago 14, Ill.
1039	Cal-Ros Industries, Inc., Chicago 22, Ill.
1040	Ferranti Electric, Inc., New York 20, N. Y.
1041	*Mayfair Molded Products Corporation, Schiller Park, Ill.
1044	*Bradford Components, Inc., Salamanca, N. Y.
1045	Gremar Manufacturing Co., Inc., Wakefield, Mass.
1048	*Columbia Technical Corporation, Woodside 77, N. Y.
1049	*Wirco Electronics, Inc., El Monte, Calif.
1050	Pomona Electronics Co., Inc., Pomona, Calif.
1051	Audio Devices, Inc., Rectifier Division, Santa Ana, Calif.
1052	*Transformer Manufacturers, Inc., Chicago 30, Ill.
1053	Industro Transistor Corporation, Long Island City 6, N. Y.
1054	Kentron Hawaii Ltd., Honolulu 14, Hawaii
1056	*Gefco Manufacturing Company, Grayslake, Ill.
1057	*Gahagan, Inc., Esmond 17, R. I.
1058	Entron Incorporated, Bladensburg, Md.
1059	*Channel Master Corporation, Ellenville, N. Y.
1060	*Schwalm Electronics, Inc., Highland Park, Ill.
1061	*Sun Capacitors, Chicago 25, Ill.
1062	*Advanced Research Associates, Inc., Kensington, Md.
1063	Philco Corporation, Accessory Division, Philadelphia, Pa.
1064	Chemtronic Corporation, Nashville 4, Tenn.
1065	Temco Aircraft Corporation, Dallas 22, Tex.
1066	*South Haven Coil, Inc., South Haven, Mich.
1067	*Wesco Electrical Co., Inc., Greenfield, Mass.
1068	Callins Industries, Inc., Greenfield, Tenn.
1069	*ESC Corporation, Palisades Park, N. J.
1070	*Paul Smith, Inc., Cincinnati 9, Ohio
1071	*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.
1072	*Hermetic Seal Transformer Co., Div. of S.I.E., Garland, Tex.
1073	*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.
1074	*Wells Electronics Company, South Bend 23, Ind.
1075	Metals & Controls Div., Texas Instruments Inc., Attleboro, Mass.
1076	*Horton and Hubbard Manufacturing Co., Nashua, N. H.
1077	*Standard Electromagnetics Inc., Frederick, Md.
1078	*Lumen, Inc., Joliet, Ill.
1079	Nortronics, A Div. of Northrop Aircraft, Inc., Hawthorne, Calif.
1080	SNC Manufacturing Co., Inc., Oshkosh, Wis.
1081	Syncro Corporation, Electronics Div., Hicksville, Ohio
1082	*Winchester Electronics, Inc., Norwalk, Conn.
1083	*Melrose Products, Inc., Willow Grove, Pa.
1084	*Transcon Manufacturing Co., Dallas 9, Tex.
1085	*Tritron Company, Milwaukee 12, Wis.
1086	*Pacific Mercury Electronics, Sepulveda, Calif.
1087	Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.
1088	*Bristol Motors Div., Vocaline Co. of America, Inc., Old Saybrook, Conn.
1089	*The R. K. Manufacturing Co., Carterville, Ill.
1090	Westinghouse Electric Corp., Director Systems Dept., Pittsburgh 6, Pa.
1091	*Telectron Company, Fort Lauderdale, Fla.
1092	*Adams Electronics Inc., Bangor, Mich.
1093	*JB Electronic Transformers, Inc., Chicago 47, Ill.
1094	*Performance Measurements Company, Detroit 35, Mich.
1095	Tele-Dynamics Inc., Philadelphia 31, Pa.
1096	*Johnson Electric Coil Company, Franklin Park, Ill.
1097	*Grand Tran, Inc., Benton Harbor, Mich.
1098	*Topic Incorporated, Natick, Mass.
1099	Land-Air Inc., Chicago 31, Ill.
1100	*Ovenaire, Inc., Charlottesville, Va.
1101	The Rauland Corporation, Chicago 41, Ill.
1102	*Technitrol Engineering Company, Philadelphia 34, Pa.
1103	Columbus Electronics Corp., Semiconductor Div., Yonkers, N. Y.
1104	*Astro-Tran, West Acton, Mass.
1105	National Semiconductor Corporation, Danbury, Conn.
1106	*Efcon, Incorporated, New York 12, N. Y.
1107	*The Wurlitzer Company, Corinth, Miss.
1108	*Yardney Electric Corp., New York 13, N. Y.

FOLDER 19

EIA WEEKLY DATE CODE

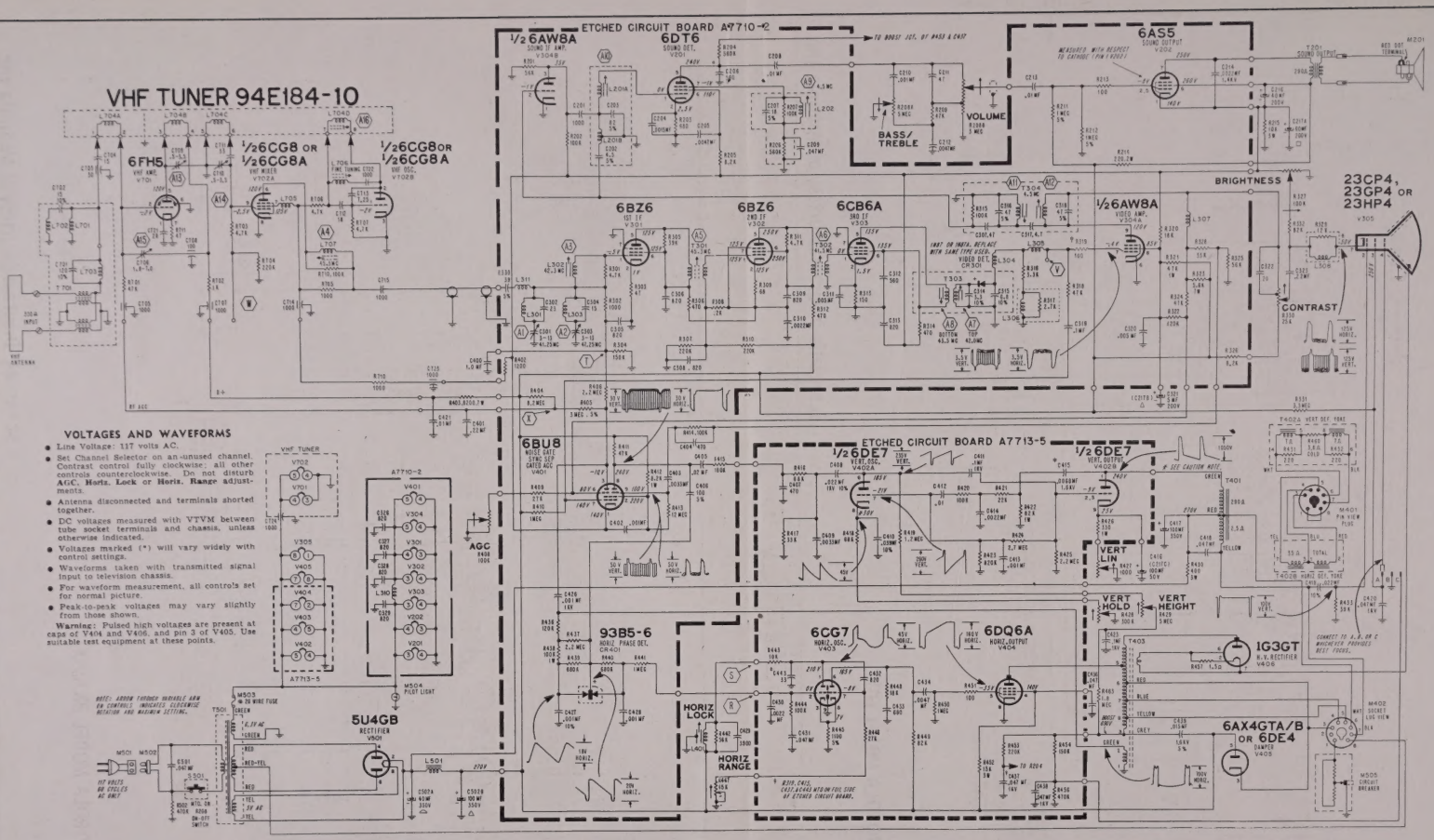
SYMBOL OF EACH WEEK IN PERIOD OF
JANUARY 3, 1960 TO DECEMBER 31, 1960

Code	Period					
01	January	3	to	January	9	Inc.
02	January	10	to	January	16	"
03	January	17	to	January	23	"
04	January	24	to	January	30	"
05	January	31	to	February	6	"
06	February	7	to	February	13	"
07	February	14	to	February	20	"
08	February	21	to	February	27	"
09	February	28	to	March	5	"
10	March	6	to	March	12	"
11	March	13	to	March	19	"
12	March	20	to	March	26	"
13	March	27	to	April	2	"
14	April	3	to	April	9	"
15	April	10	to	April	16	"
16	April	17	to	April	23	"
17	April	24	to	April	30	"
18	May	1	to	May	7	"
19	May	8	to	May	14	"
20	May	15	to	May	21	"
21	May	22	to	May	28	"
22	May	29	to	June	4	"
23	June	5	to	June	11	"
24	June	12	to	June	18	"
25	June	19	to	June	25	"
26	June	26	to	July	2	"
27	July	3	to	July	9	"
28	July	10	to	July	16	"
29	July	17	to	July	23	"
30	July	24	to	July	30	"
31	July	31	to	August	6	"
32	August	7	to	August	13	"
33	August	14	to	August	20	"
34	August	21	to	August	27	"
35	August	28	to	September	3	"
36	September	4	to	September	10	"
37	September	11	to	September	17	"
38	September	18	to	September	24	"
39	September	25	to	October	1	"
40	October	2	to	October	8	"
41	October	9	to	October	15	"
42	October	16	to	October	22	"
43	October	23	to	October	29	"
44	October	30	to	November	5	"
45	November	6	to	November	12	"
46	November	13	to	November	19	"
47	November	20	to	November	26	"
48	November	27	to	December	3	"
49	December	4	to	December	10	"
50	December	11	to	December	17	"
51	December	18	to	December	24	"
52	December	25	to	December	31	"

EIA WEEKLY DATE CODE

SYMBOL OF EACH WEEK IN PERIOD OF
JANUARY 1, 1961 TO DECEMBER 30, 1961

Code	Period					
01	January	1	to	January	7	Inc
02	January	8	to	January	14	"
03	January	15	to	January	21	"
04	January	22	to	January	28	"
05	January	29	to	February	4	"
06	February	5	to	February	11	"
07	February	12	to	February	18	"
08	February	19	to	February	25	"
09	February	26	to	March	4	"
10	March	5	to	March	11	"
11	March	12	to	March	18	"
12	March	19	to	March	25	"
13	March	26	to	April	1	"
14	April	2	to	April	8	"
15	April	9	to	April	15	"
16	April	16	to	April	22	"
17	April	23	to	April	29	"
18	April	30	to	May	6	"
19	May	7	to	May	13	"
20	May	14	to	May	20	"
21	May	21	to	May	27	"
22	May	28	to	June	3	"
23	June	4	to	June	10	"
24	June	11	to	June	17	"
25	June	18	to	June	24	"
26	June	25	to	July	1	"
27	July	2	to	July	8	"
28	July	9	to	July	15	"
29	July	16	to	July	22	"
30	July	23	to	July	29	"
31	July	30	to	August	5	"
32	August	6	to	August	12	"
33	August	13	to	August	19	"
34	August	20	to	August	26	"
35	August	27	to	September	2	"
36	September	3	to	September	9	"
37	September	10	to	September	16	"
38	September	17	to	September	23	"
39	September	24	to	September	30	"
40	October	1	to	October	7	"
41	October	8	to	October	14	"
42	October	15	to	October	21	"
43	October	22	to	October	28	"
44	October	29	to	November	4	"
45	November	5	to	November	11	"
46	November	12	to	November	18	"
47	November	19	to	November	25	"
48	November	26	to	December	2	"
49	December	3	to	December	4	"
50	December	10	to	December	16	"
51	December	17	to	December	23	"
52	December	24	to	December	30	"



ADMIRAL MODELS C24K111, C24K112, C24K113, C24K142, C24K145, L24K131, L24K132, L24K133, L24K152, L24K157, T24K110, T24K111, T24K112, T24K113 (CH. 18B7)

Schematic Diagram Courtesy of Admiral Corporation

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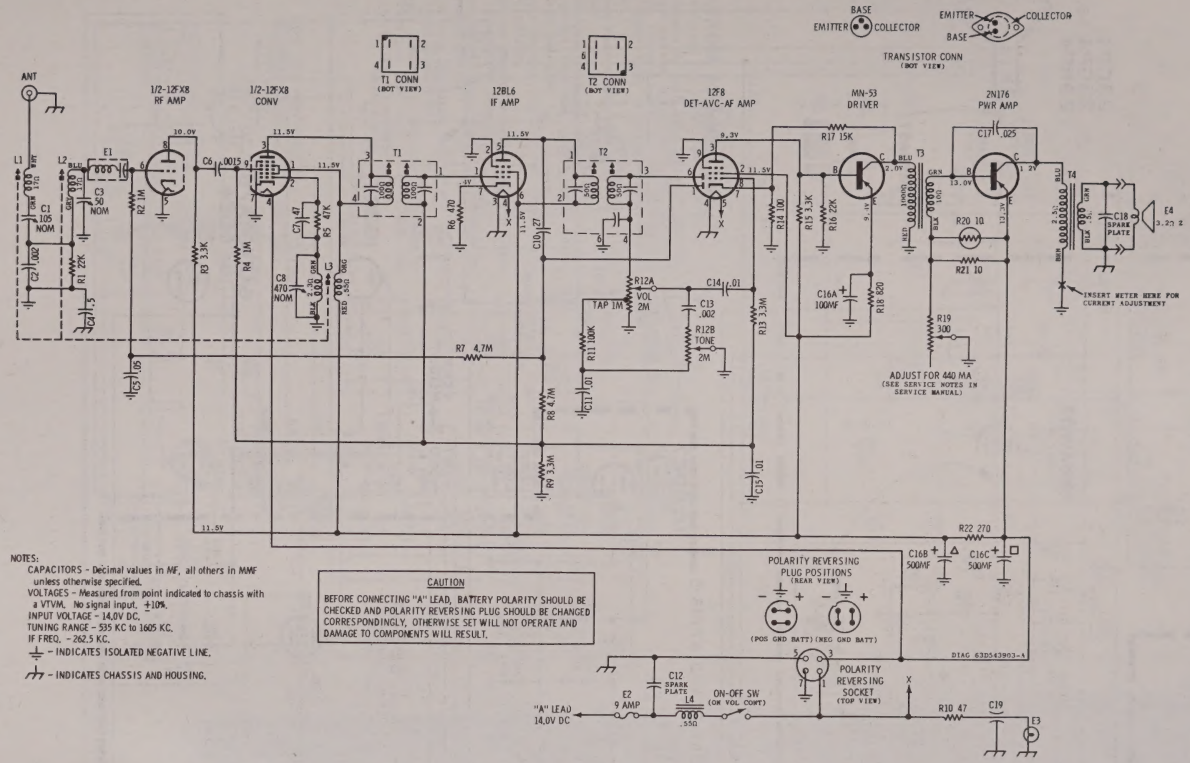
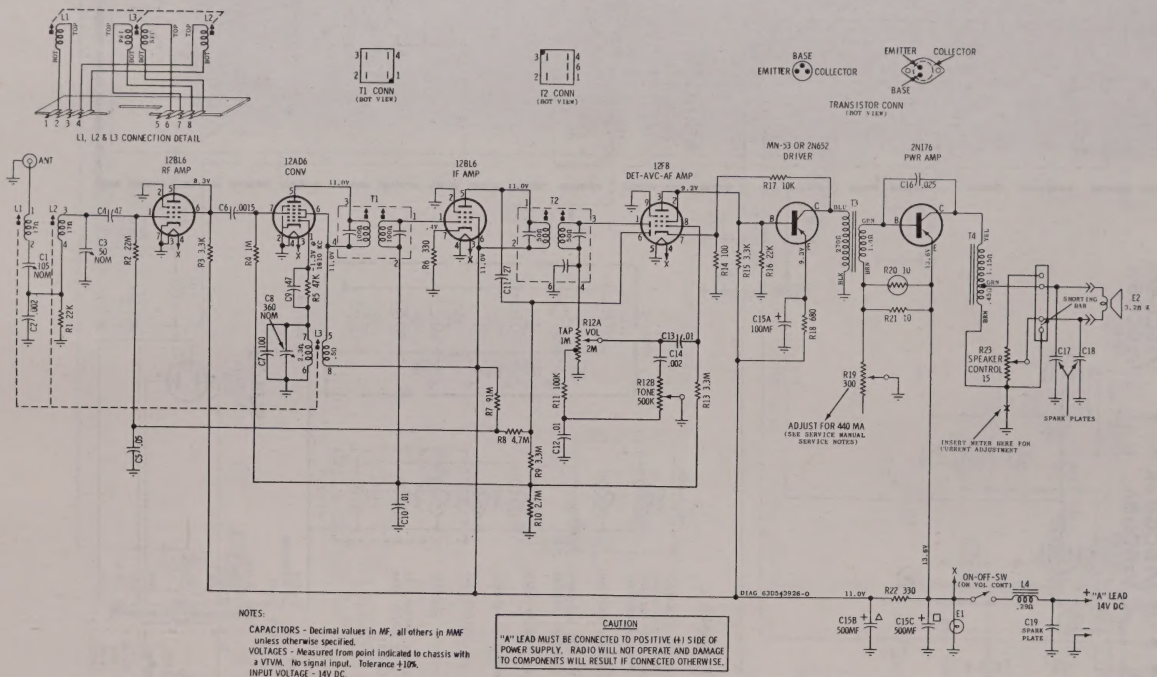

ANT
1/2-12FX8 RF AMP
1/2-12FX8 CONV
T1 CONN (BOT VIEW)
12BL6 IF AMP
T2 CONN (BOT VIEW)
12F8 DET-AVC-AF AMP
MN-53 DRIVER
2N176 PWR AMP
TRANSISTOR CONN (BOT VIEW)
BASE EMITTER COLLECTOR
EMITTER BASE COLLECTOR
R17 15K
C17 .025
R20 10
R21 10
R19 300
ADJUST FOR 440 MA (SEE SERVICE NOTES IN SERVICE MANUAL)
INSERT METER HERE FOR CURRENT ADJUSTMENT
C18 SPARE PLATE
E4 3.2Ω
R12A VOL 2M
R12B TONE 2M
TAP 1M
C14 .01
C13 .002
R7 4.7M
R8 4.7M
R9 3.3M
C16A 100MF
C16B 500MF
C16C 500MF
R22 270
POLARITY REVERSING PLUG POSITIONS (REAR VIEW)
(POS GND BATT) (NEG GND BATT)
POLARITY REVERSING SOCKET (TOP VIEW)
DIAG 63D543903-A
C12 SPARK PLATE
E2 9 AMP
L4 .55Ω
ON-OFF SW (ON VOL CONT)
"A" LEAD 14.0V DC
R10 47
C19
E3
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. ±10%.
INPUT VOLTAGE - 14.0V DC.
TUNING RANGE - 535 KC to 1605 KC.
IF FREQ. - 262.5 KC.
⏚ - INDICATES ISOLATED NEGATIVE LINE.
⏚ - INDICATES CHASSIS AND HOUSING.
CAUTION
BEFORE CONNECTING "A" LEAD, BATTERY POLARITY SHOULD BE CHECKED AND POLARITY REVERSING PLUG SHOULD BE CHANGED CORRESPONDINGLY, OTHERWISE SET WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT.

MOTOROLA MODEL 601X

Schematic Diagram Courtesy of Motorola Inc.



NOTES:

CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance ±10%.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

CAUTION

"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

MOTOROLA MODEL BKA60X

Schematic Diagram Courtesy of Motorola Inc.